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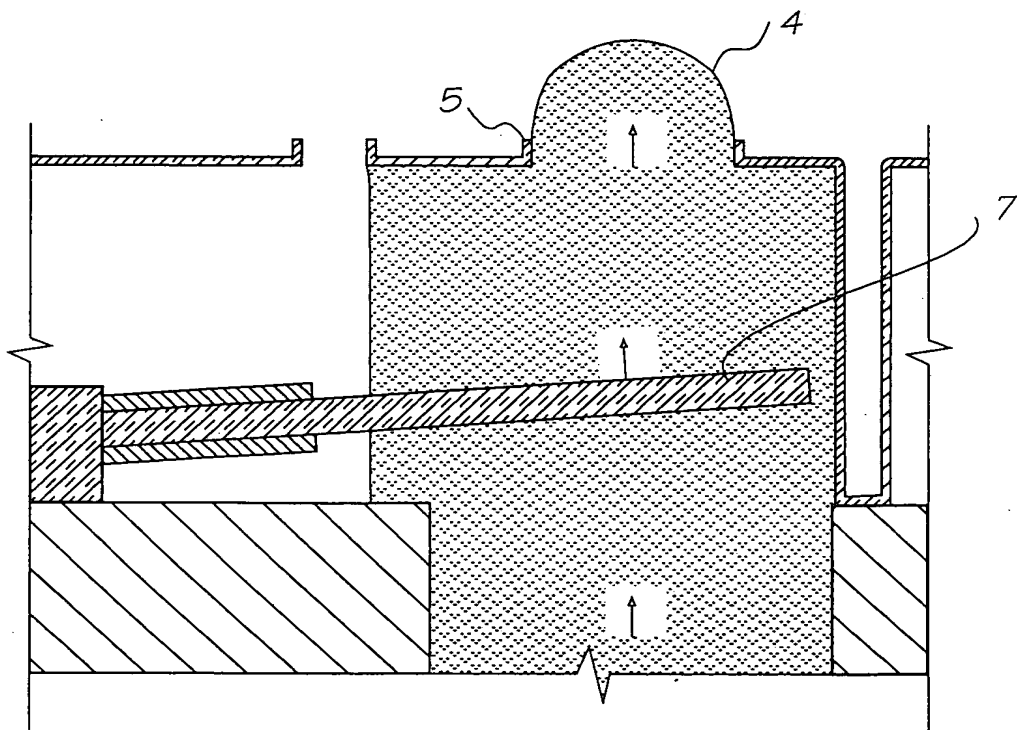
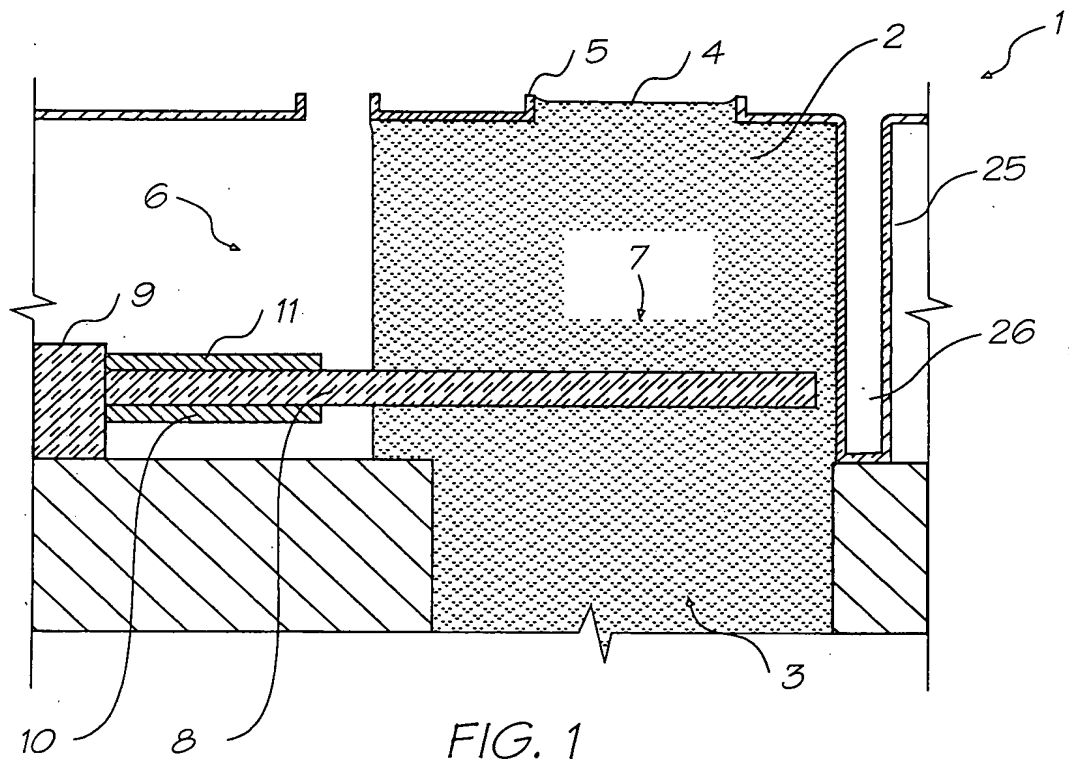
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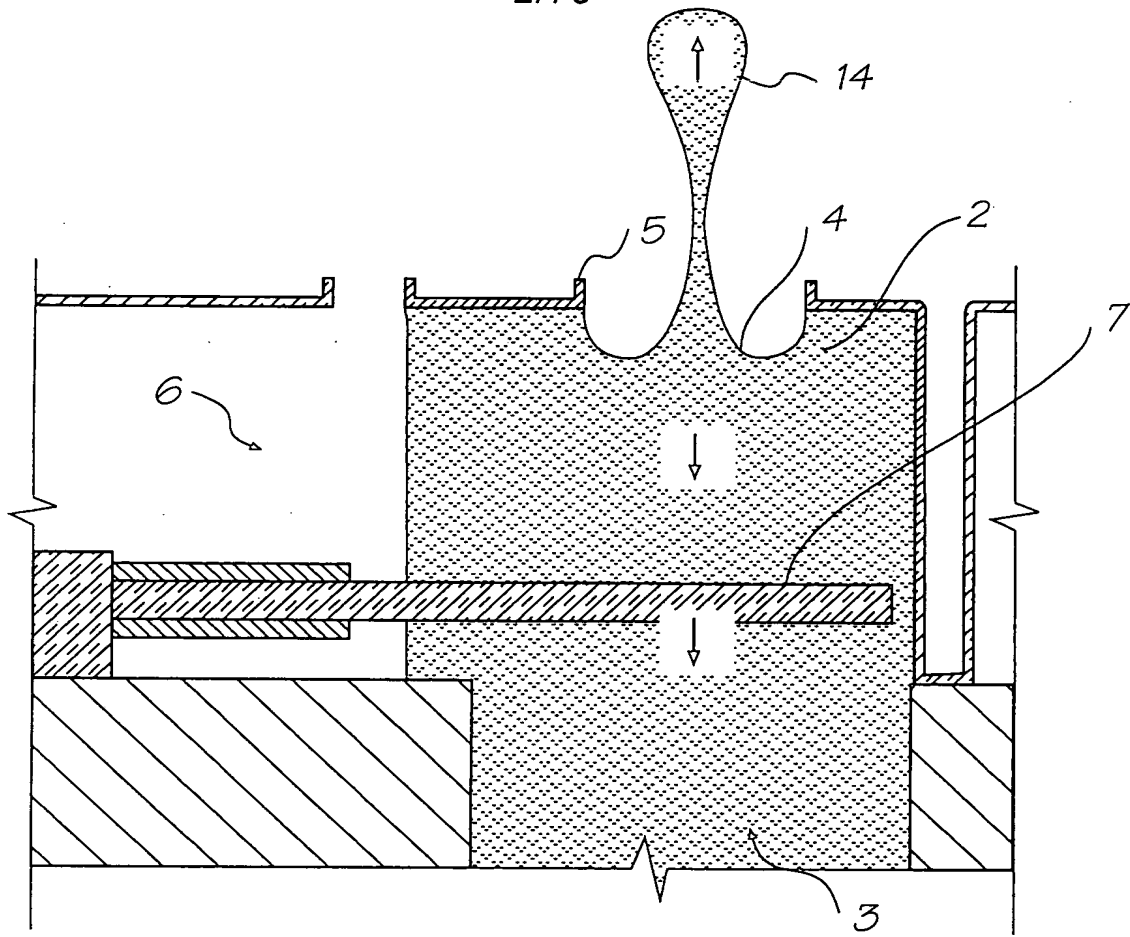
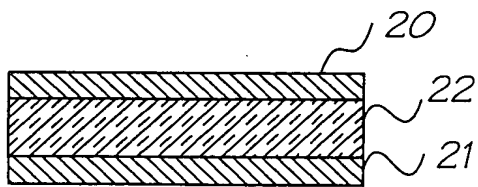


FIG. 3



↓ Cooling

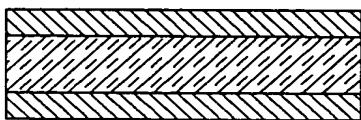
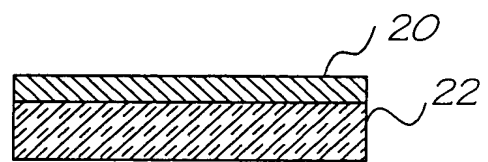


FIG. 4



↓ Cooling

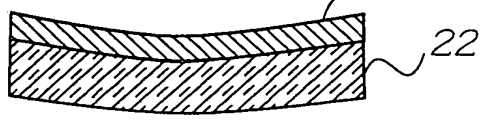


FIG. 5

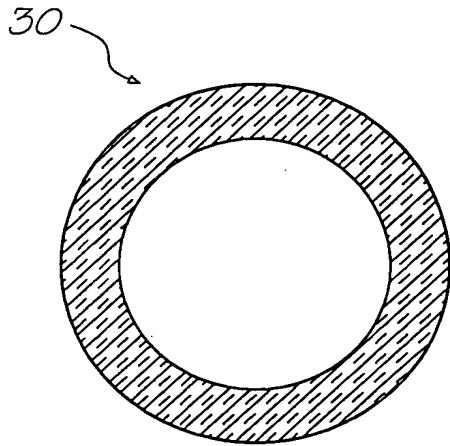


FIG. 6

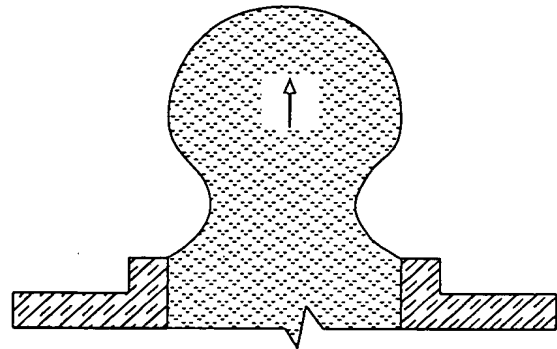


FIG. 7

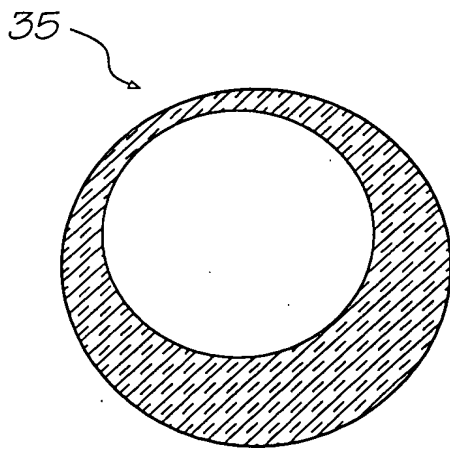


FIG. 8

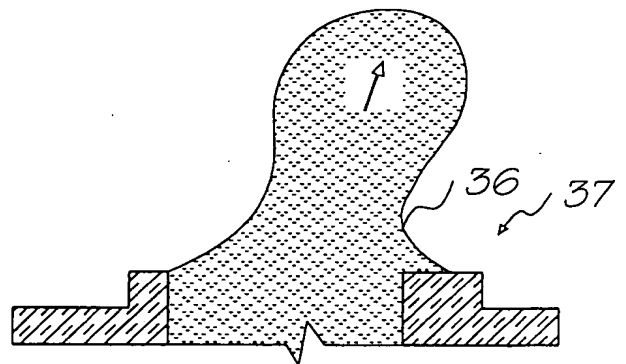


FIG. 9

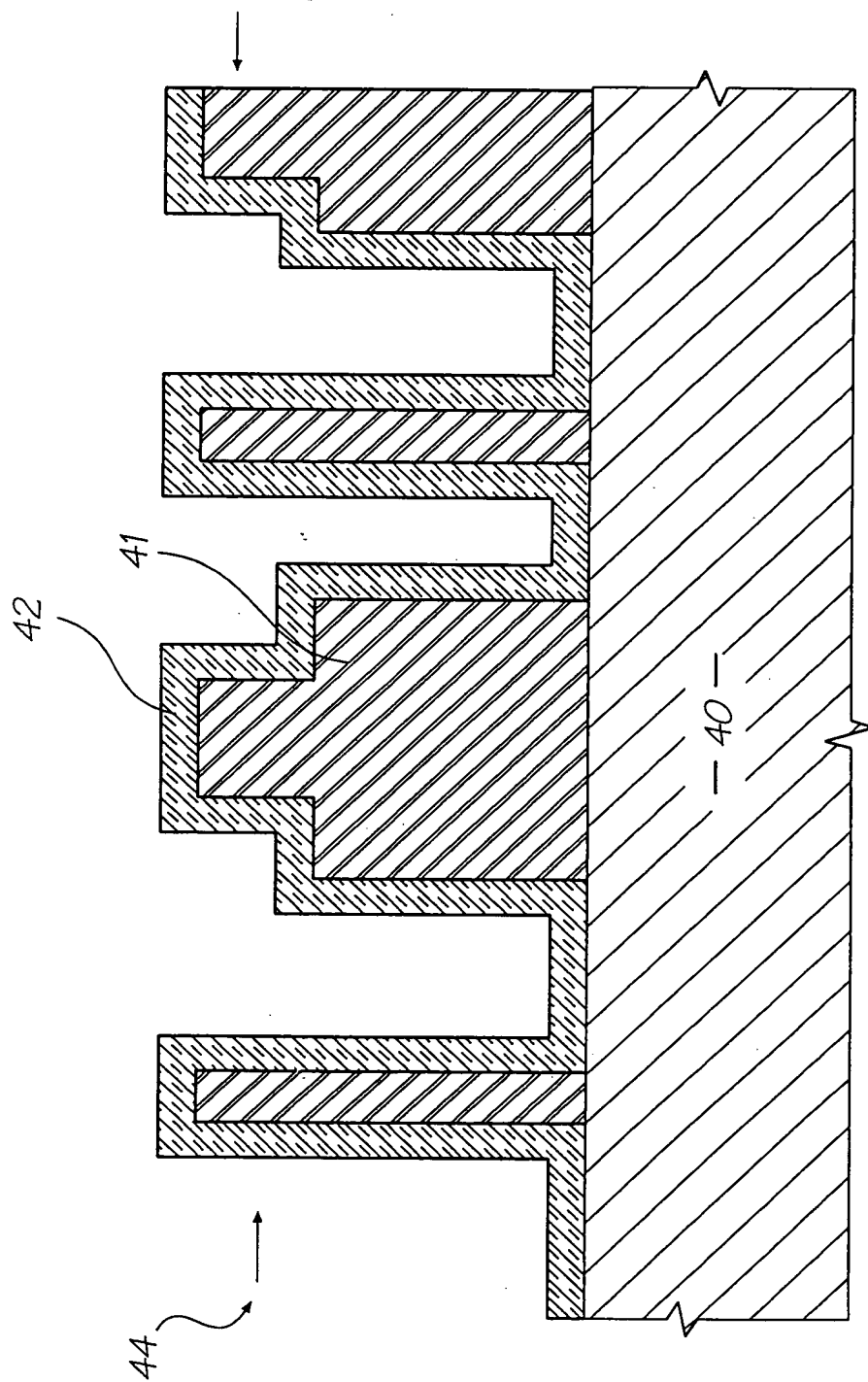


FIG. 10

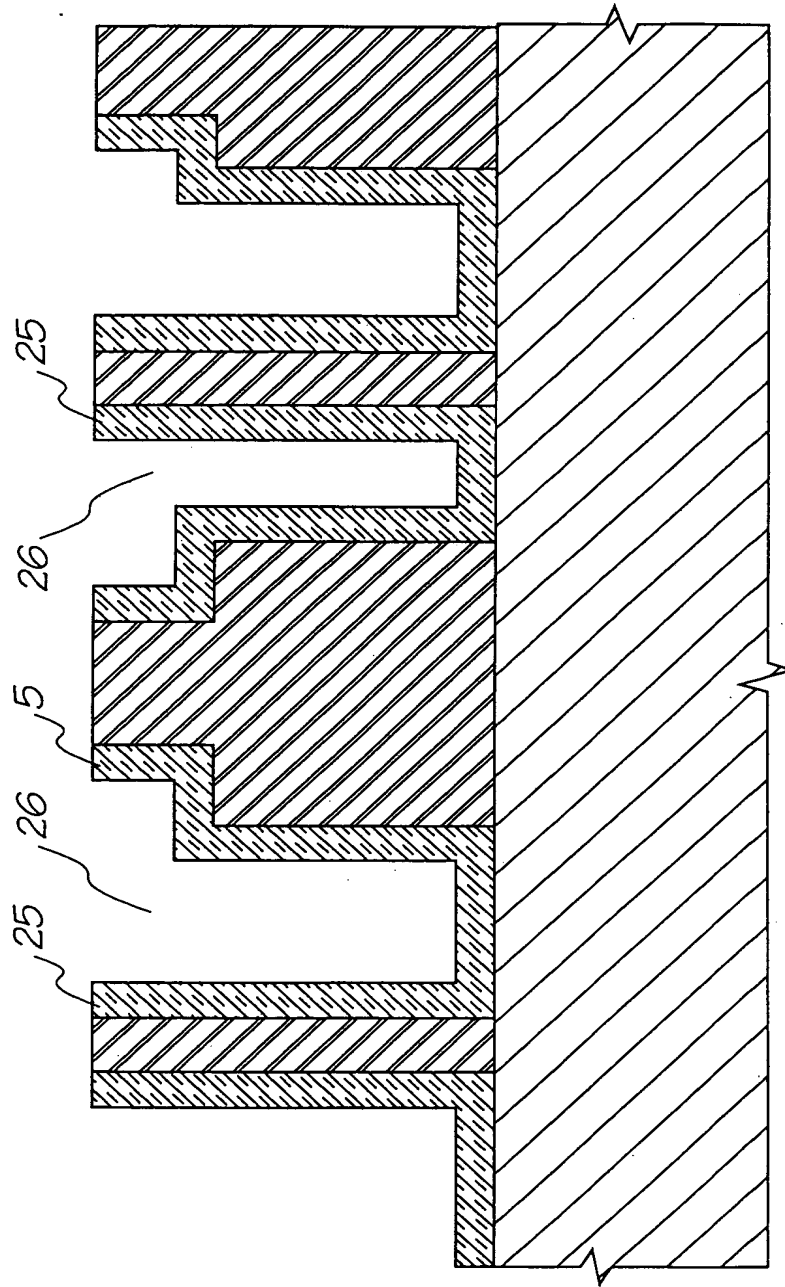


FIG. 11

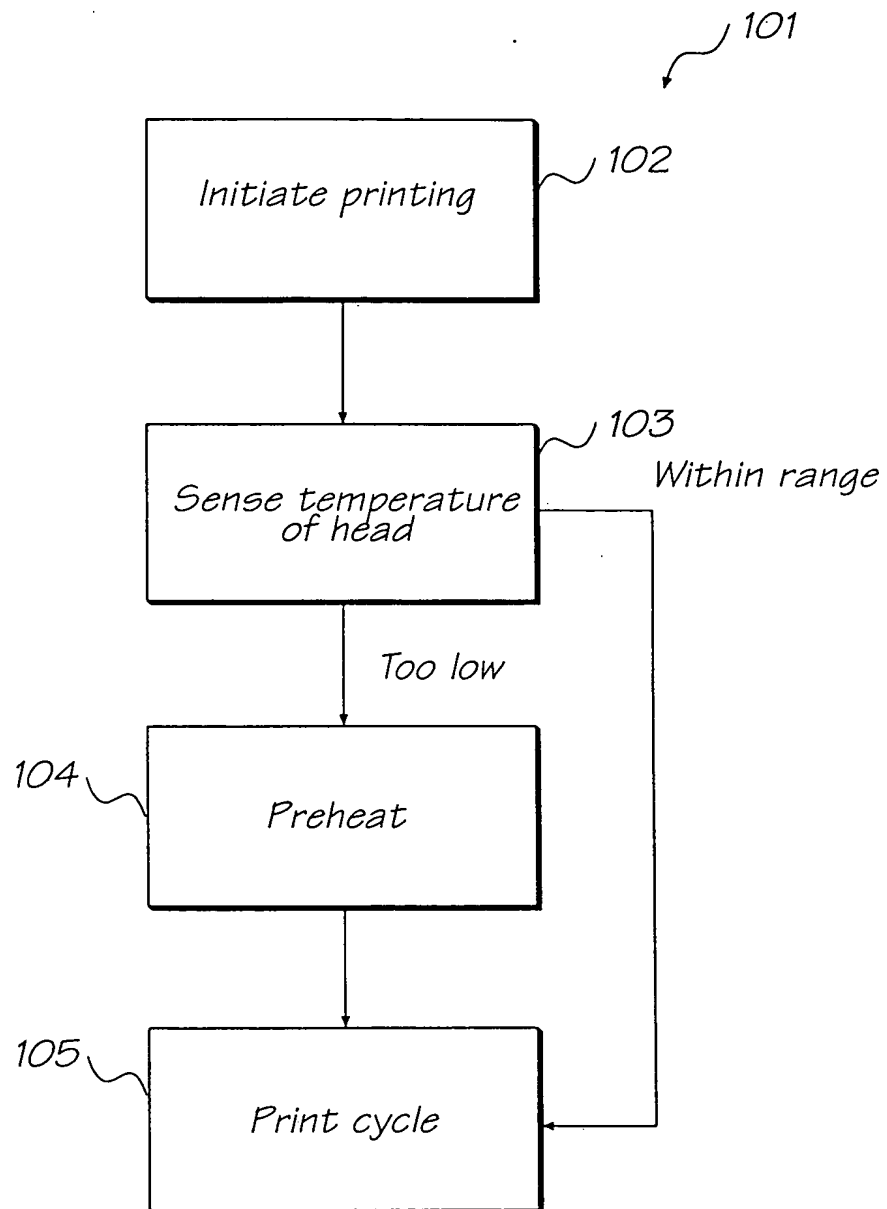


FIG. 12

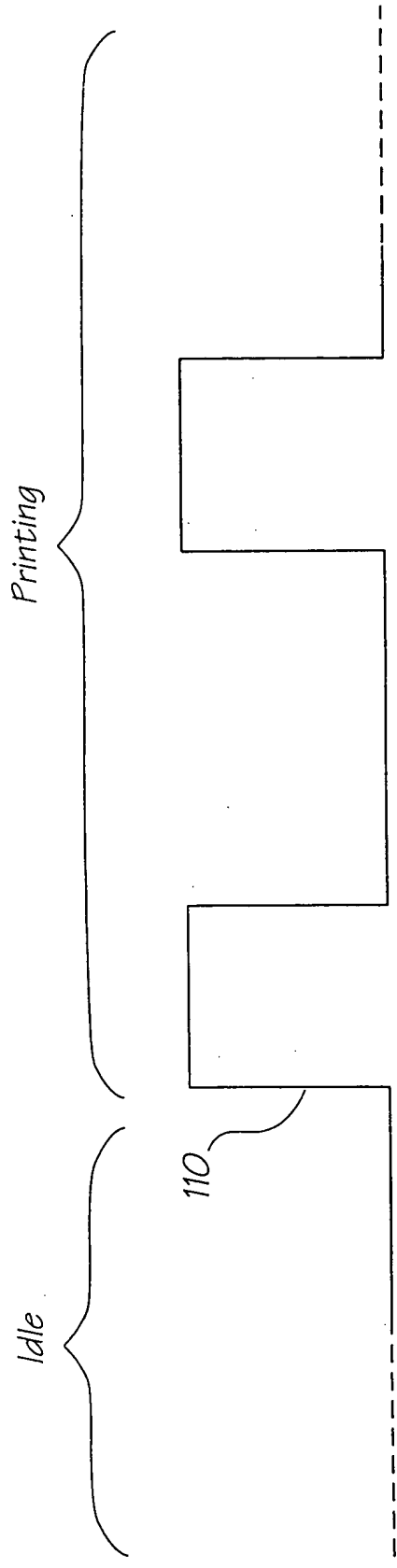


FIG. 13

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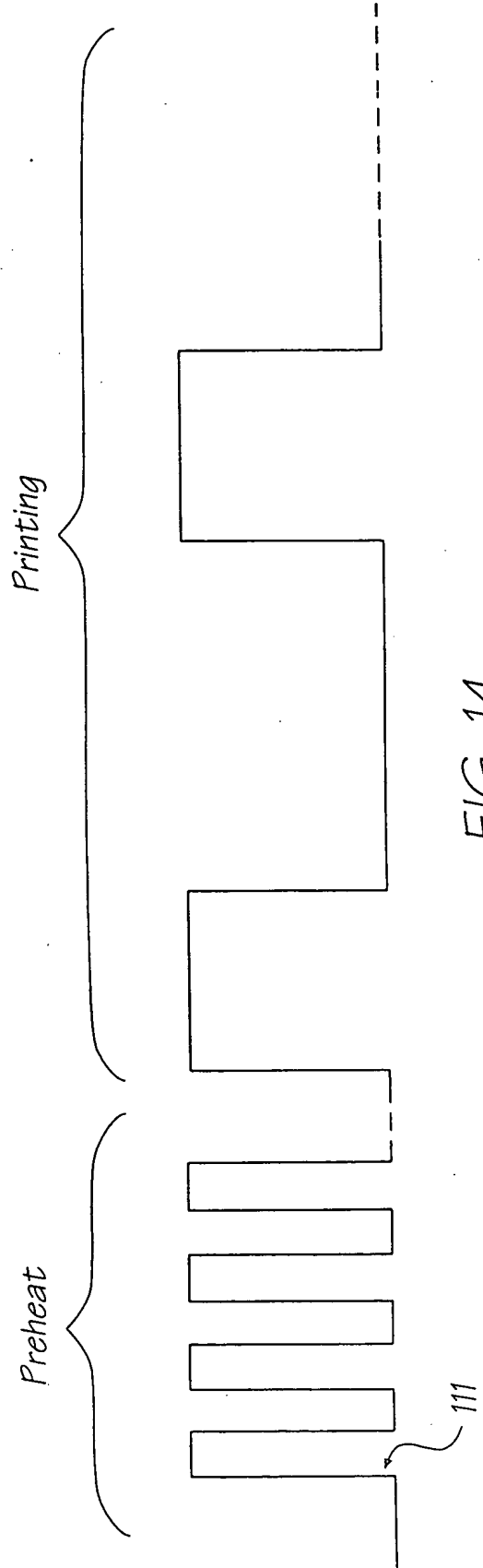


FIG. 14



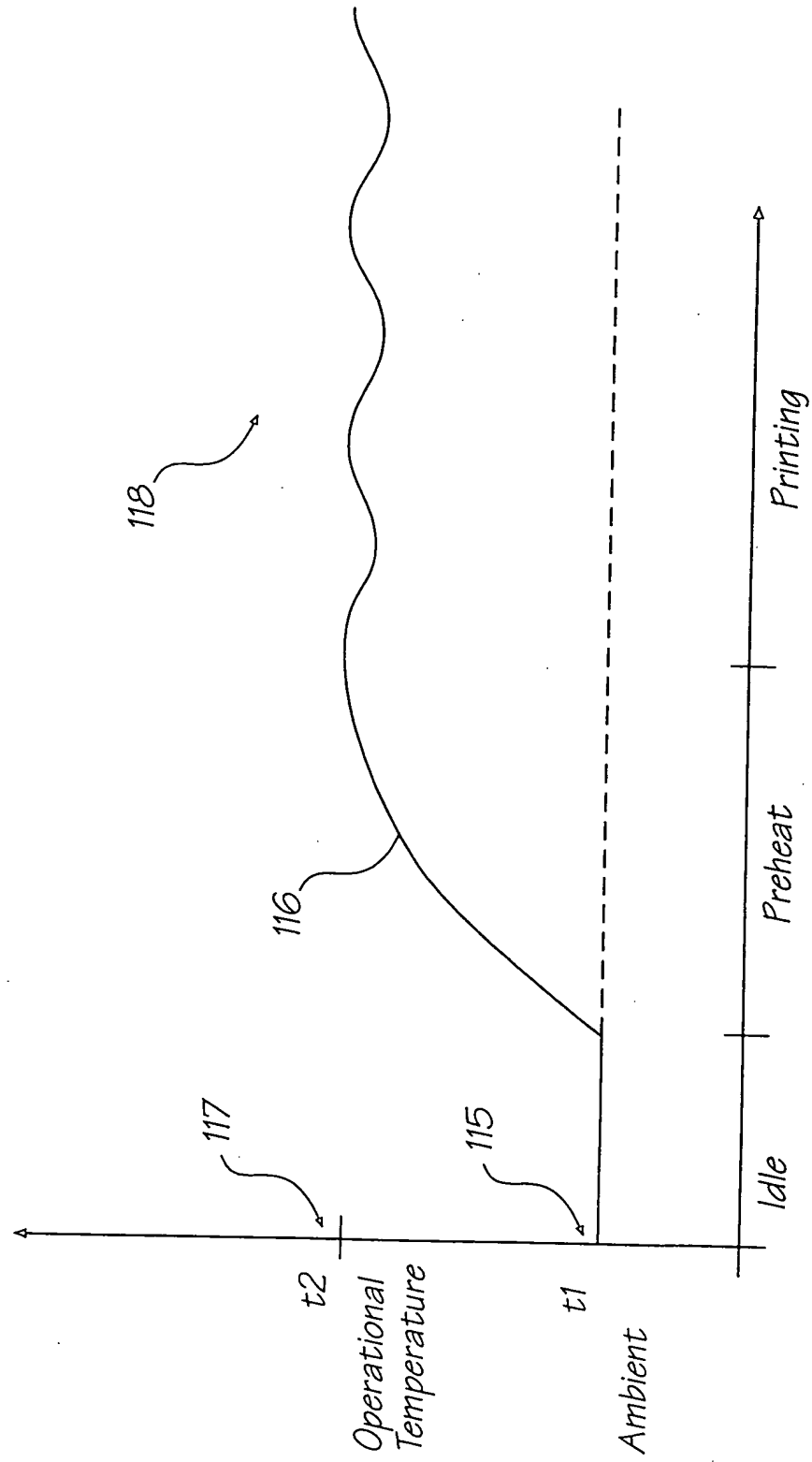


FIG. 15

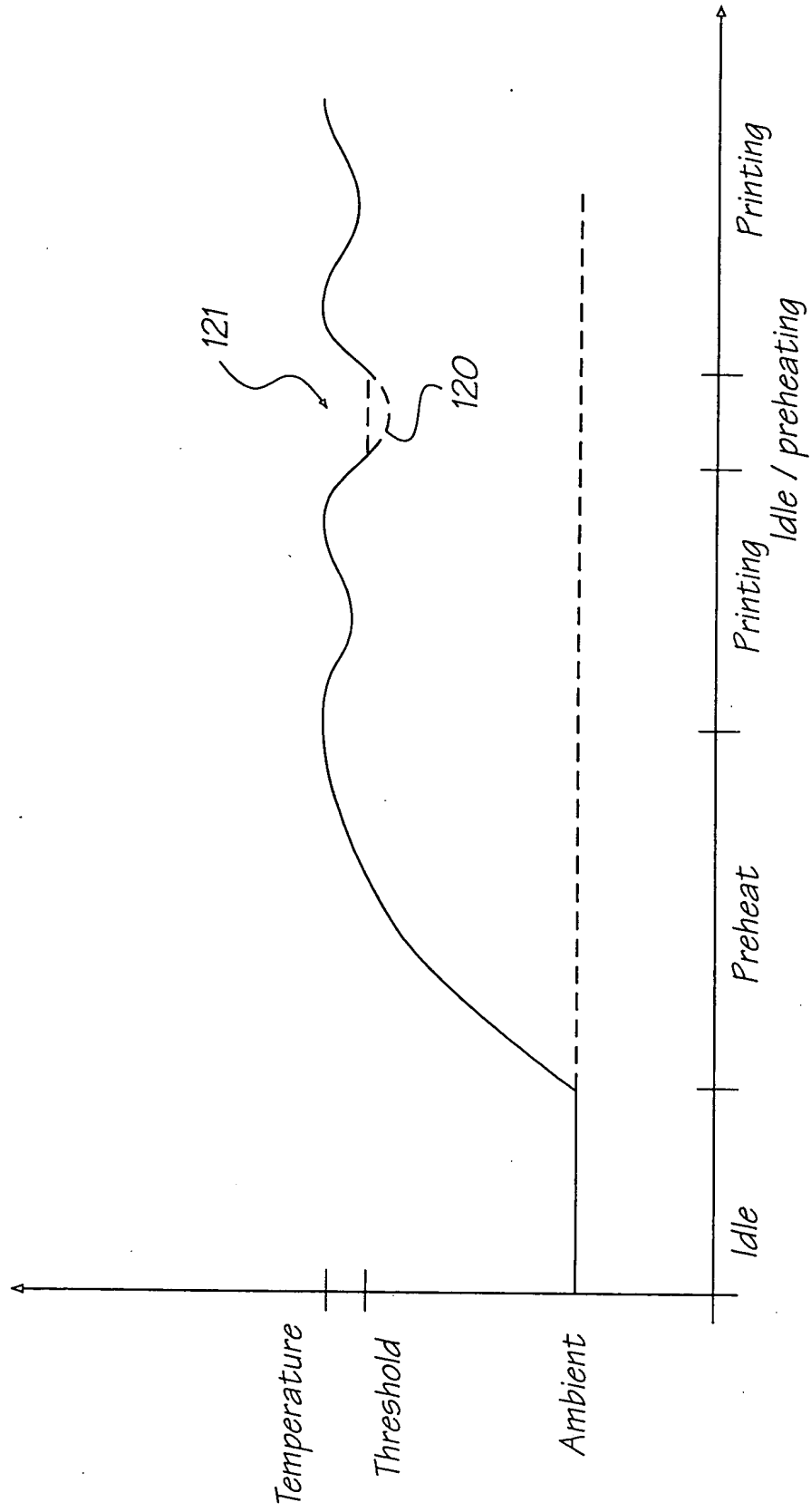


FIG. 16

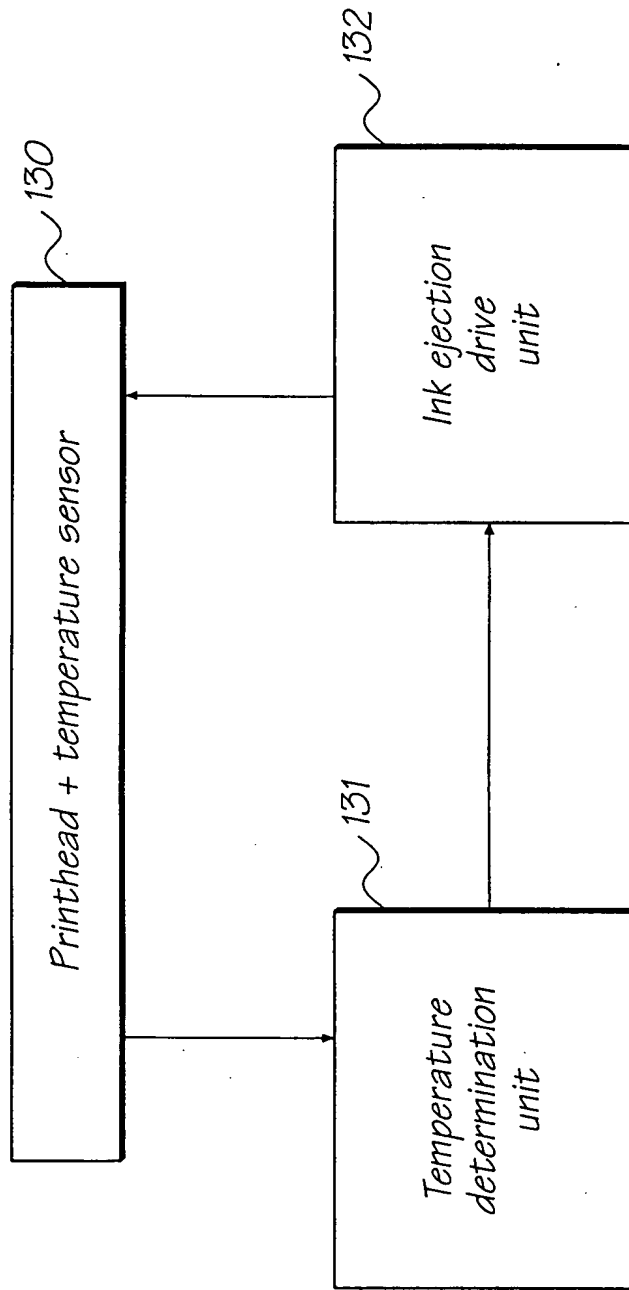


FIG. 17

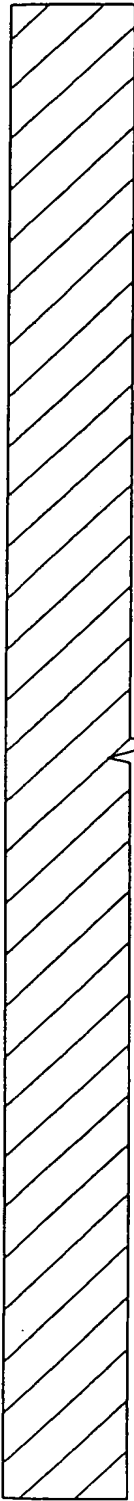
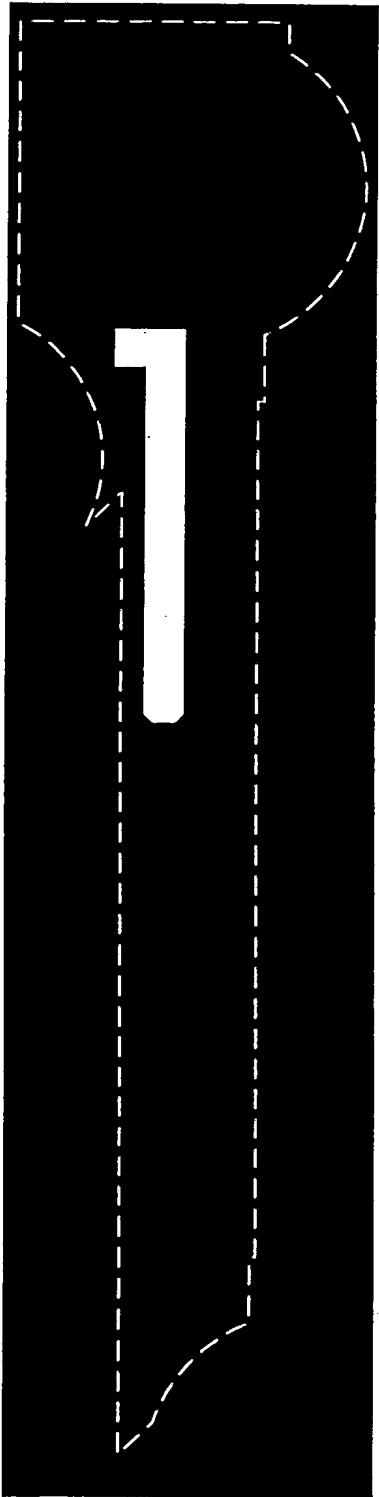


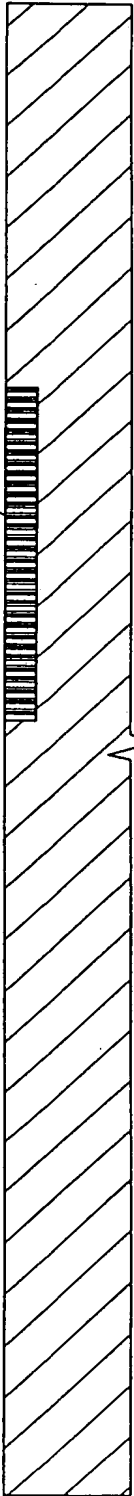
FIG. 18



N-Well mask

FIG. 19

210



Implant N-Well

FIG. 20

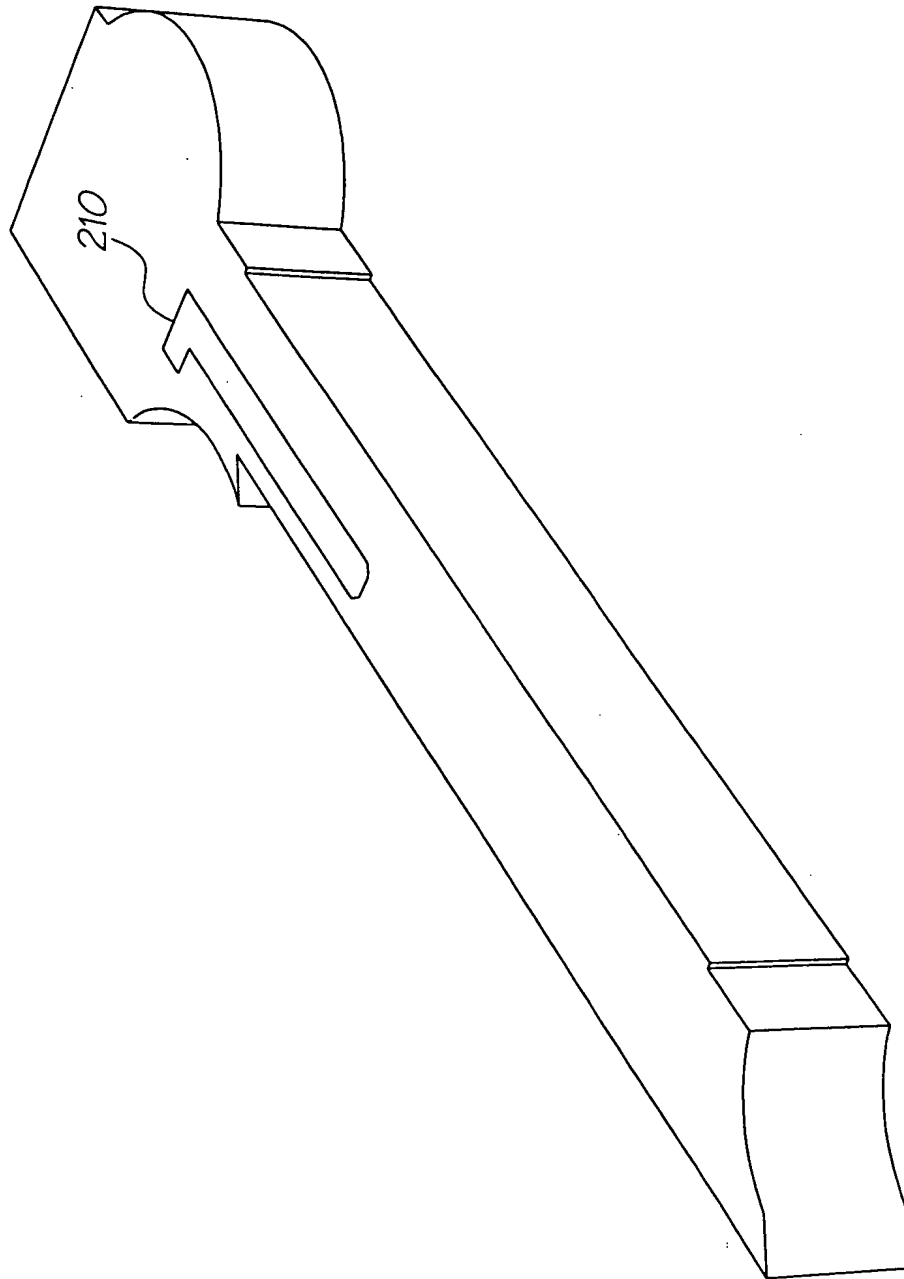
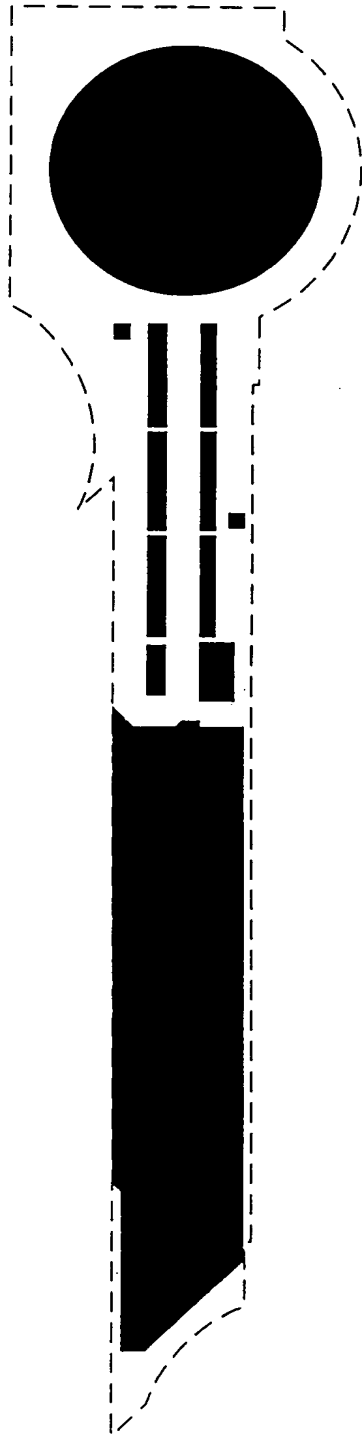
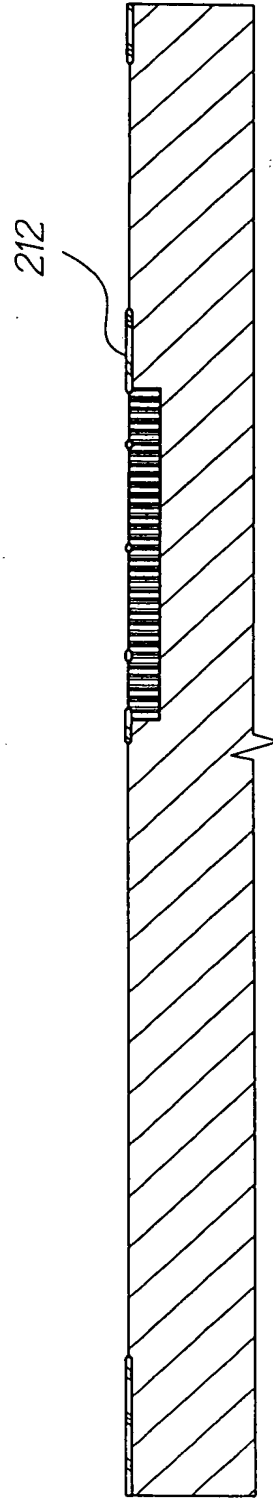


FIG. 21



Active mask

FIG. 22



Grow field oxide

FIG. 23

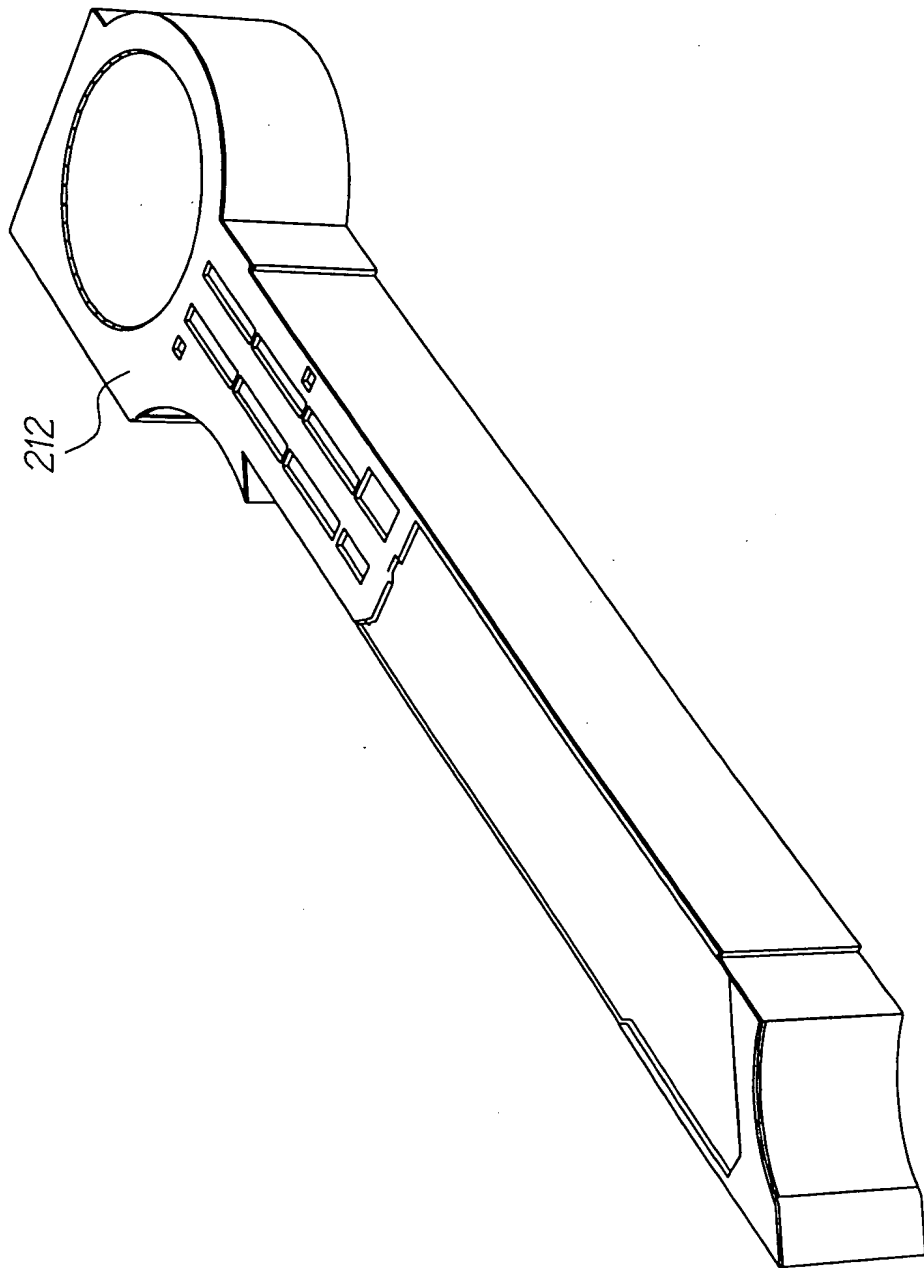
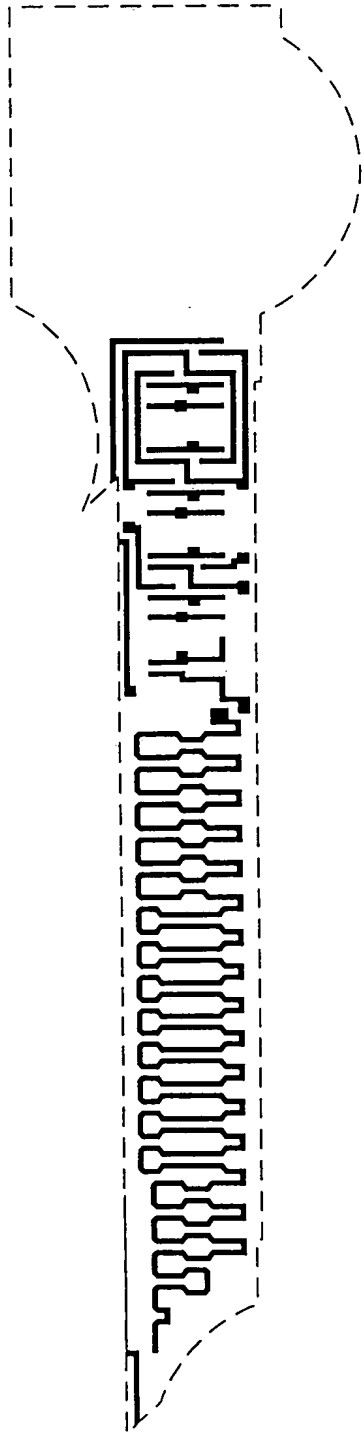
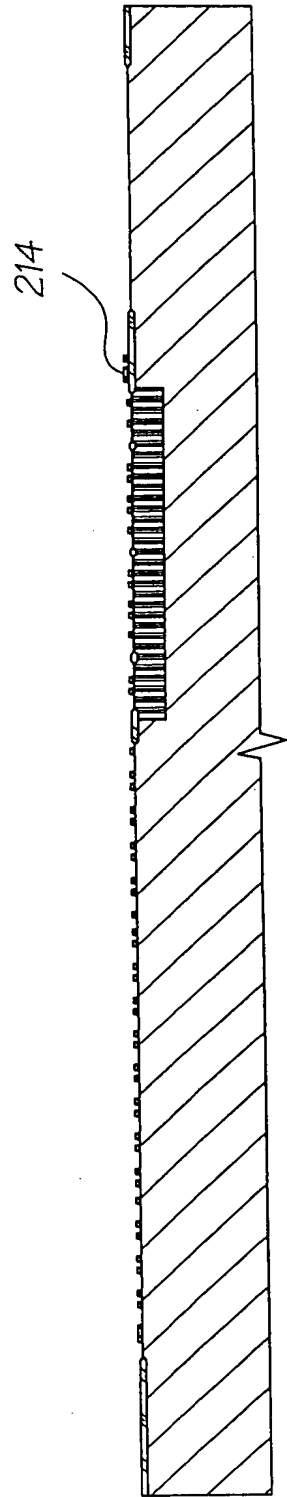


FIG. 24



Poly mask

FIG. 25



Deposit poly

FIG. 26



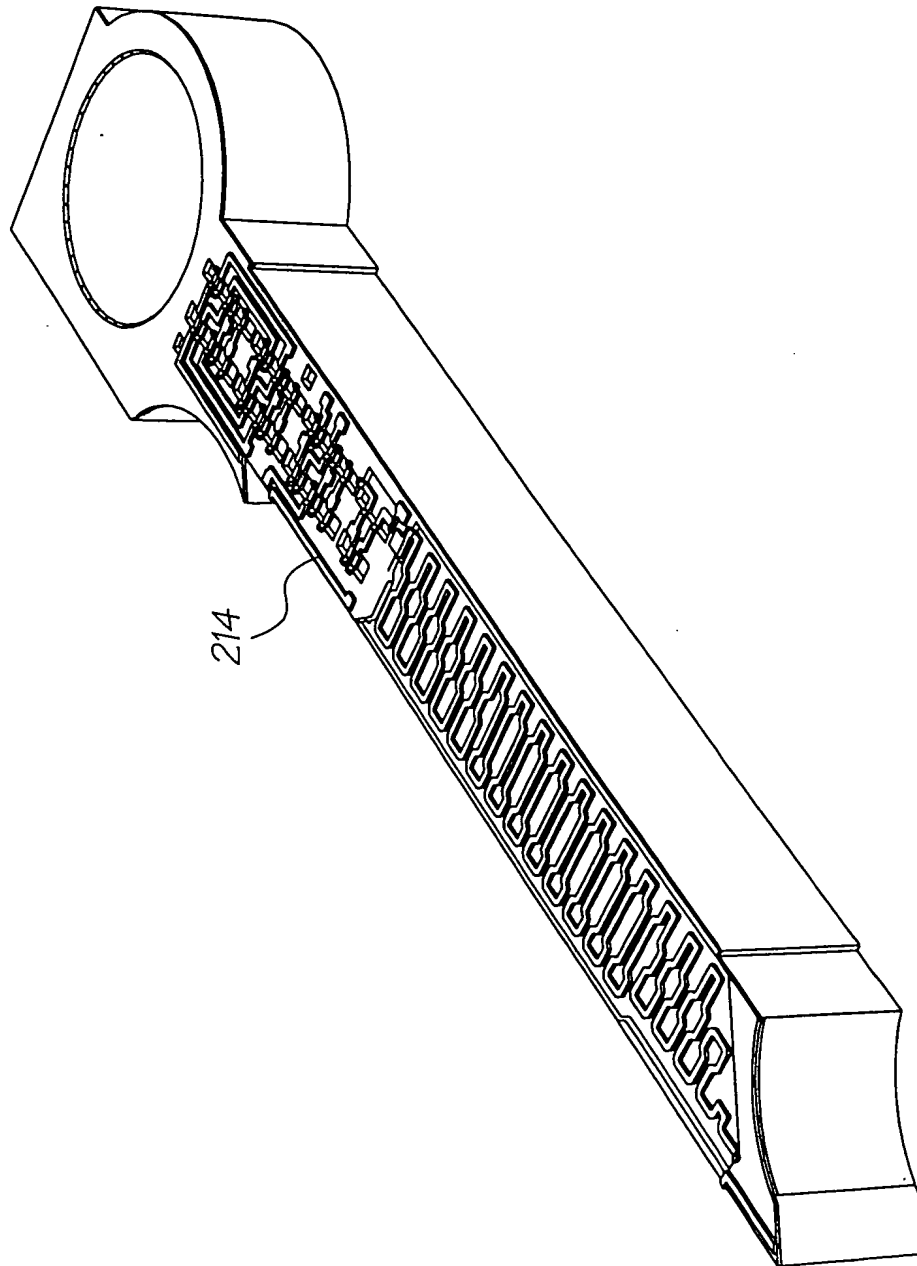
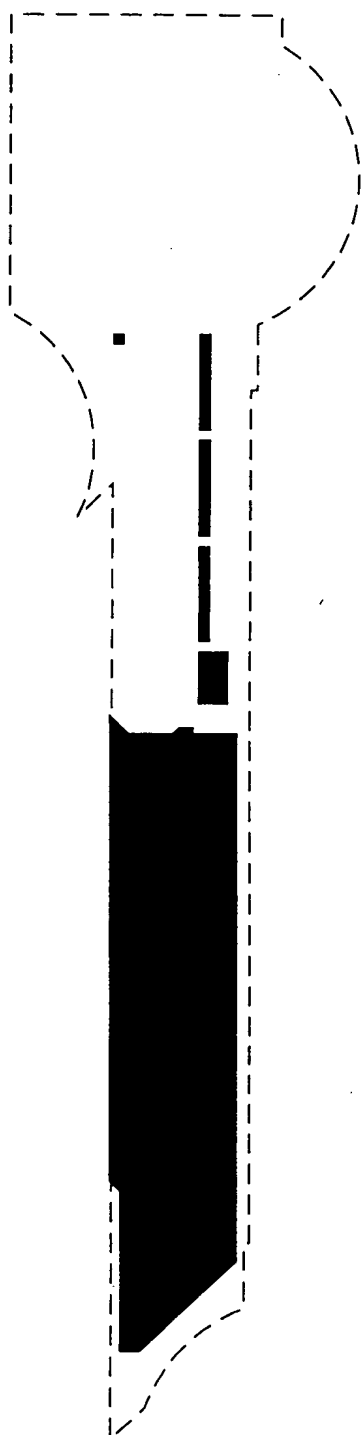
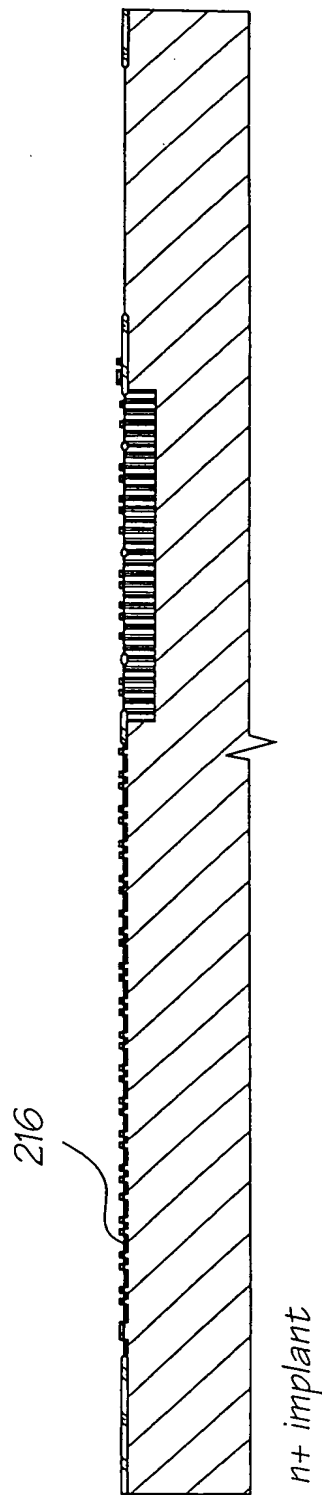


FIG. 27



*n+ mask*

FIG. 28



*n+ implant*

FIG. 29

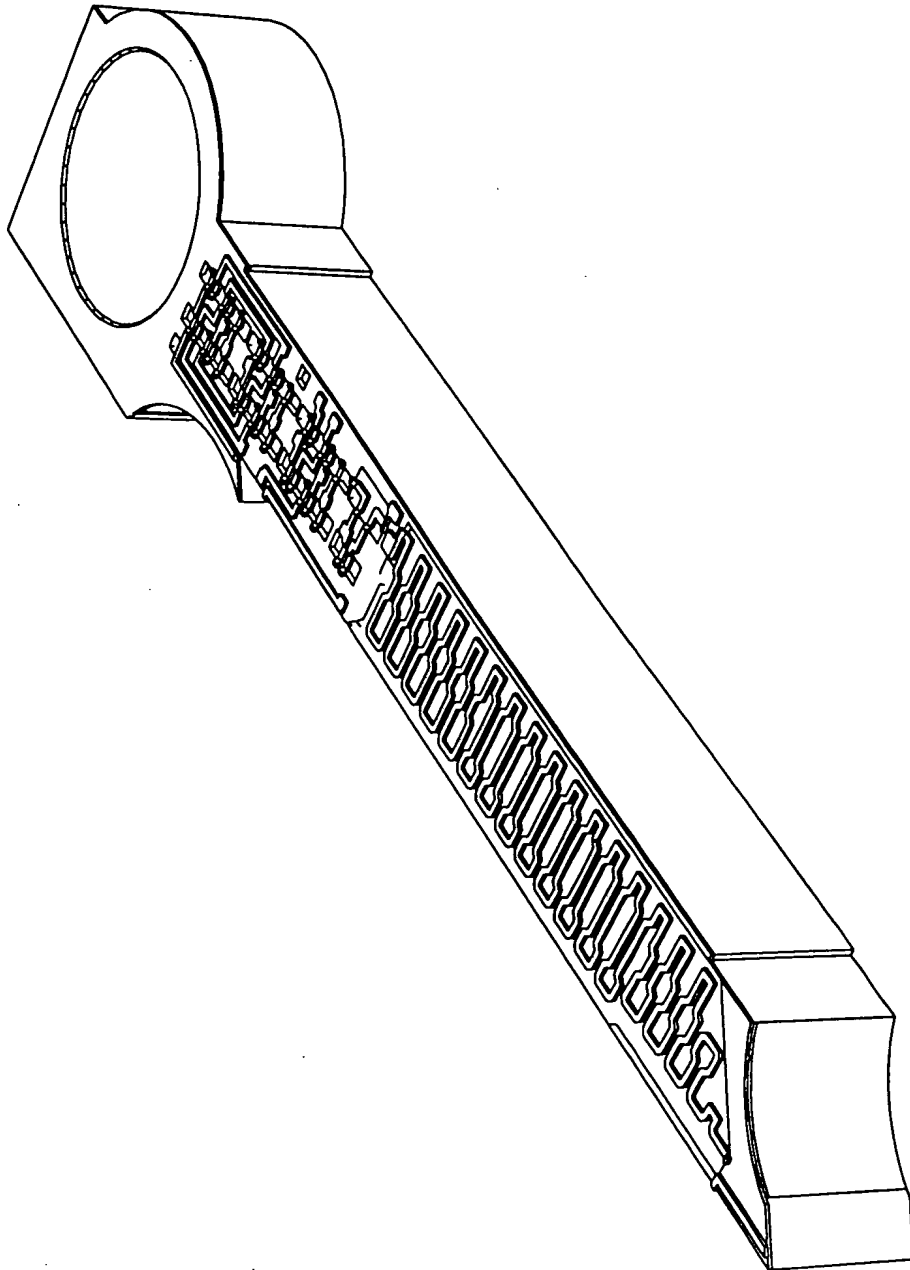
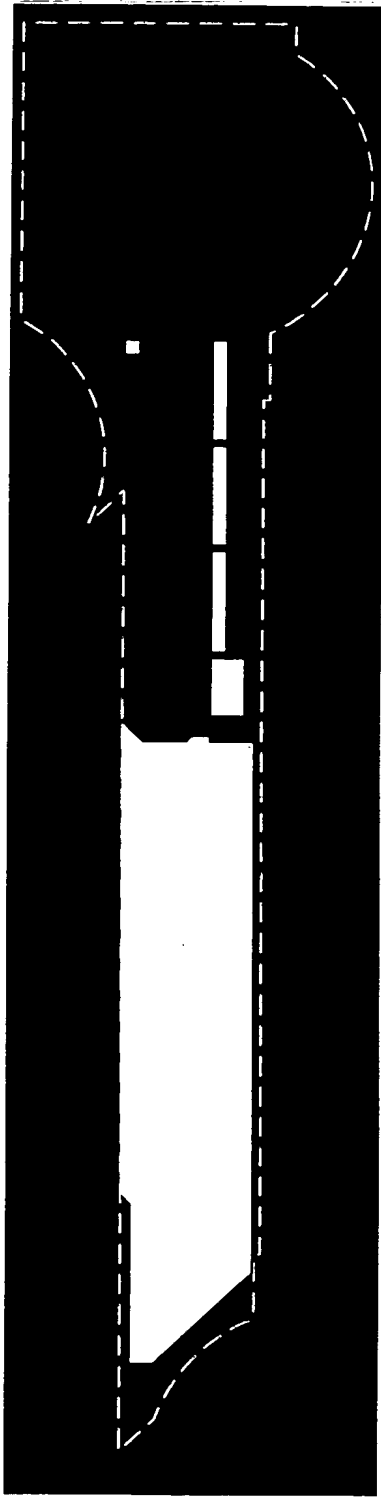
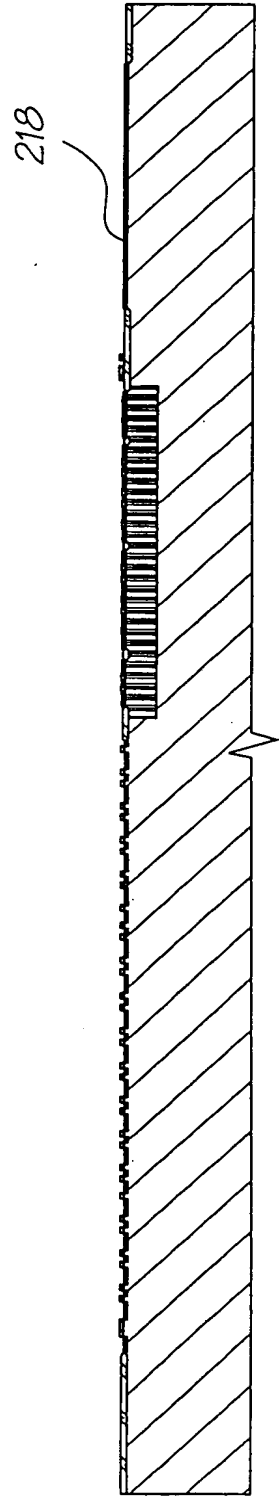


FIG. 30



p+ mask

FIG. 31



p+ implant

FIG. 32

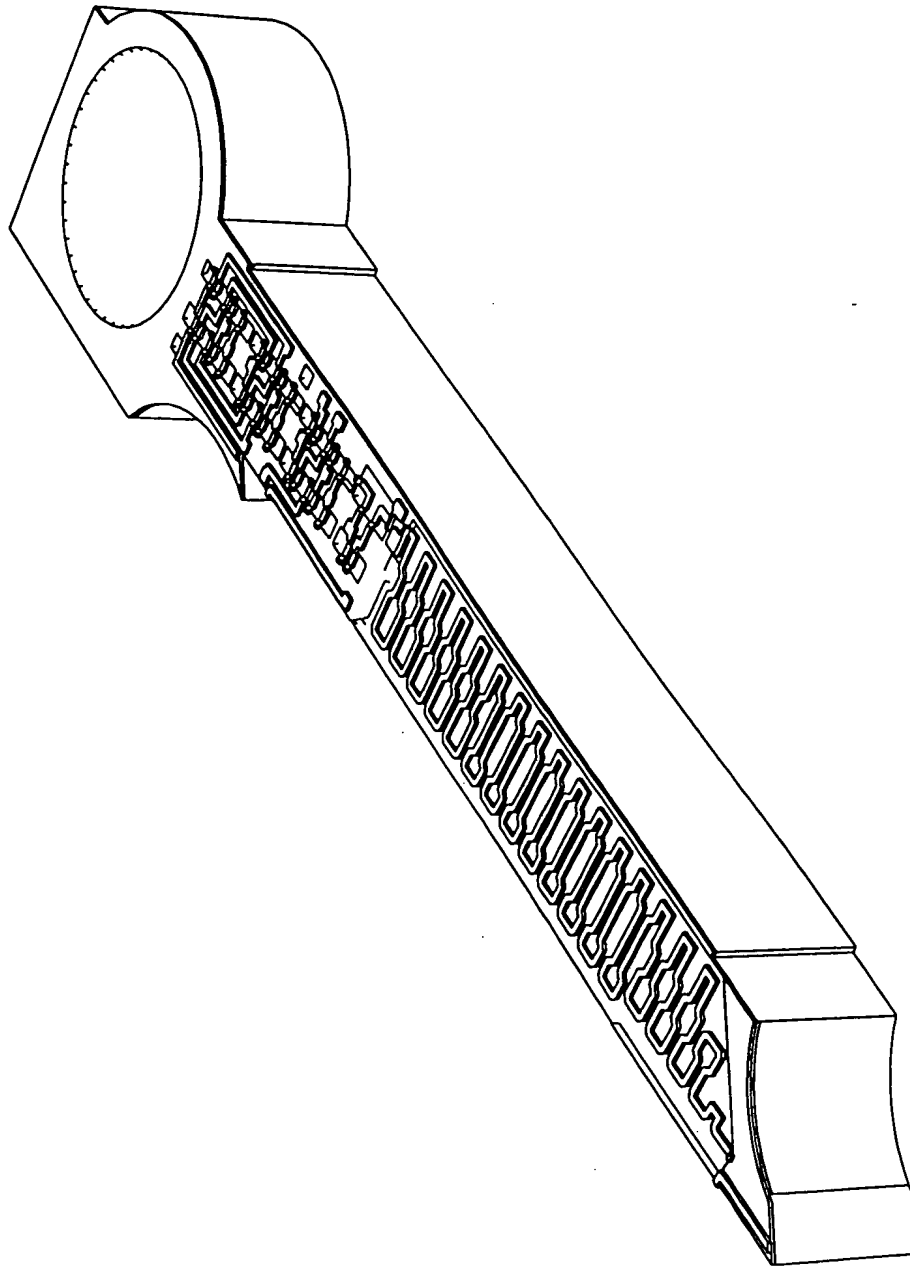
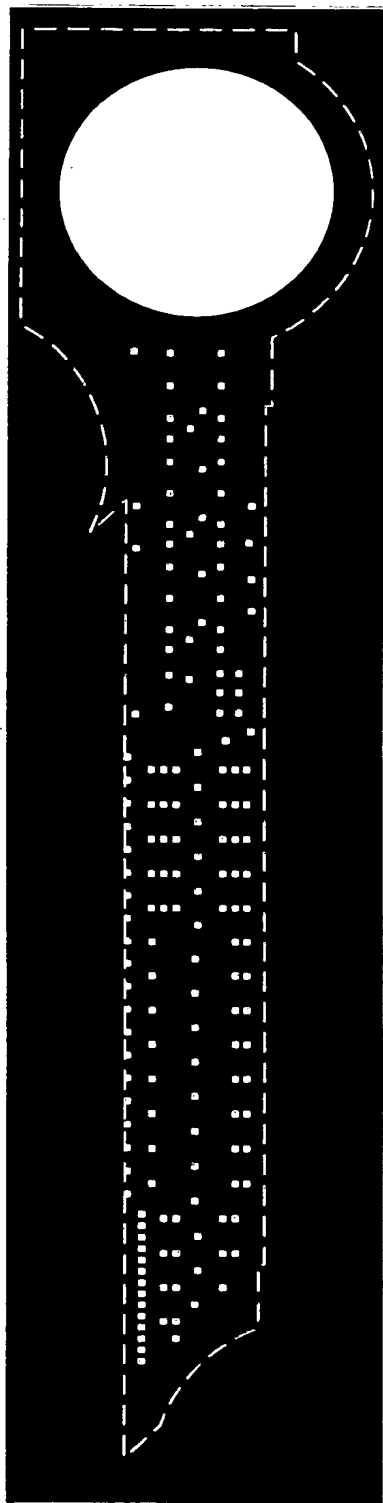
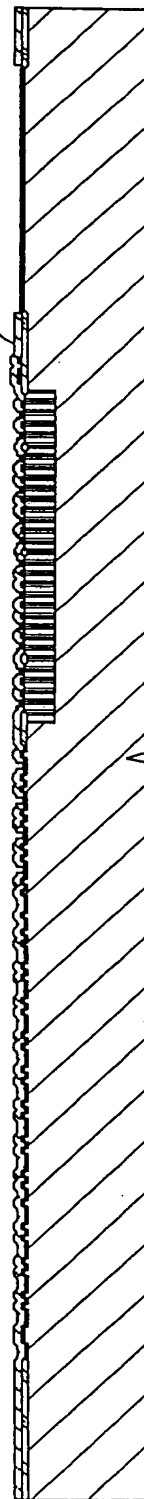


FIG. 33



*Contacts mask*

*FIG. 34*



*Deposit ILD 1, etch contacts*

*FIG. 35*

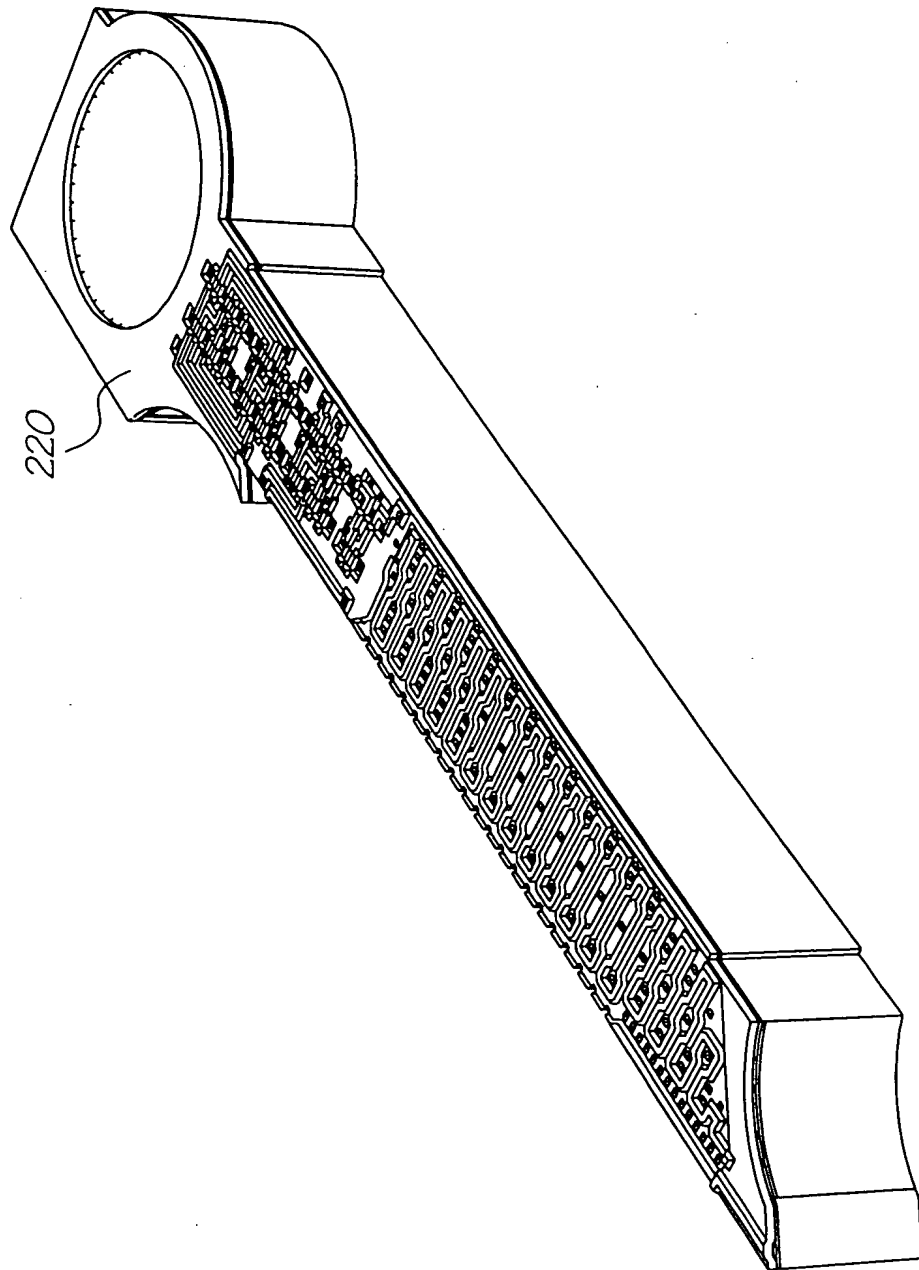
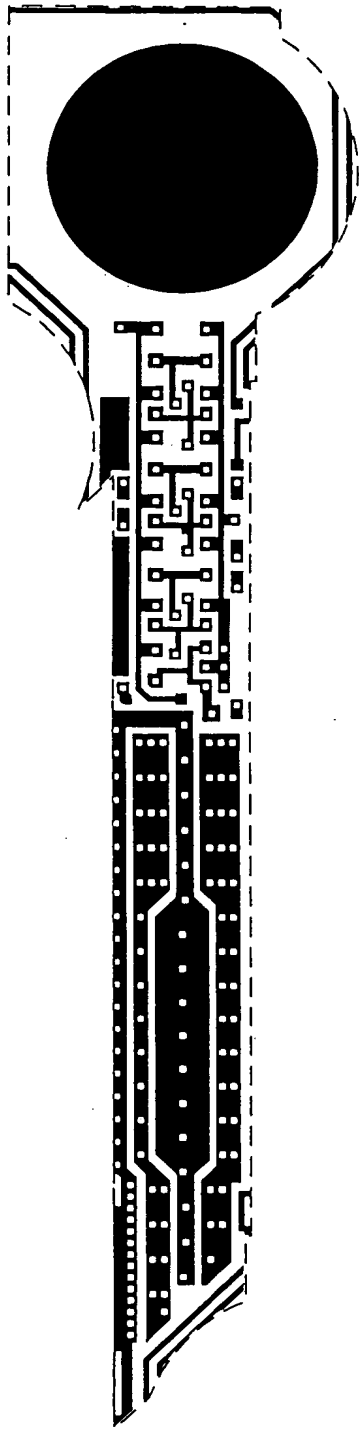
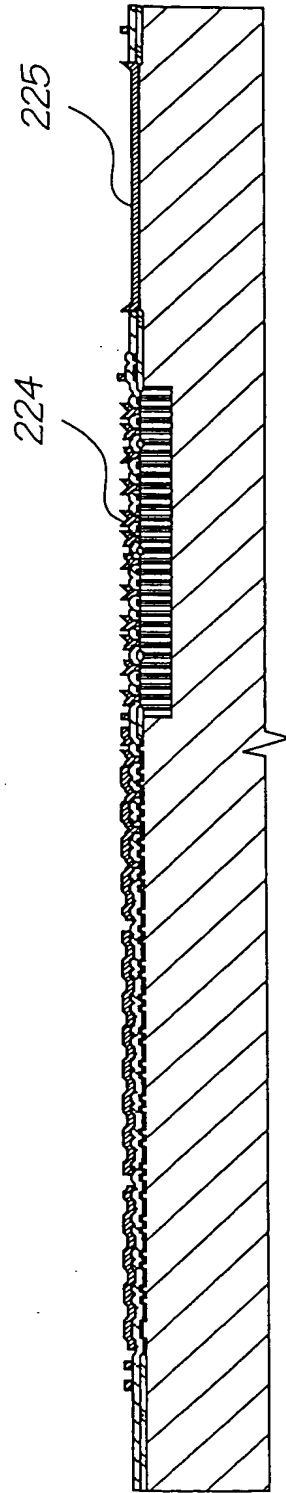


FIG. 36



Metal 1 mask

FIG. 37



Deposit Metal 1

FIG. 38



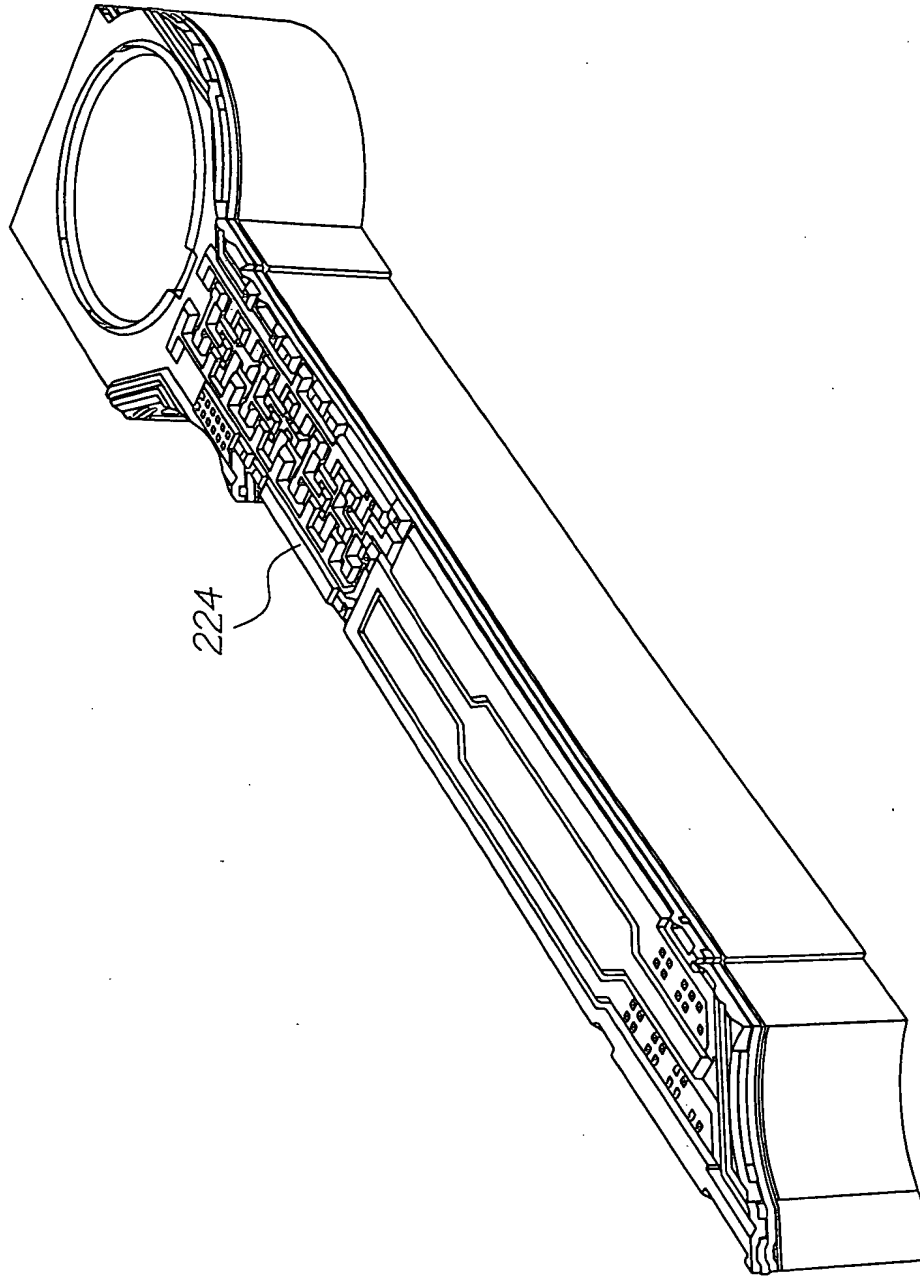


FIG. 39

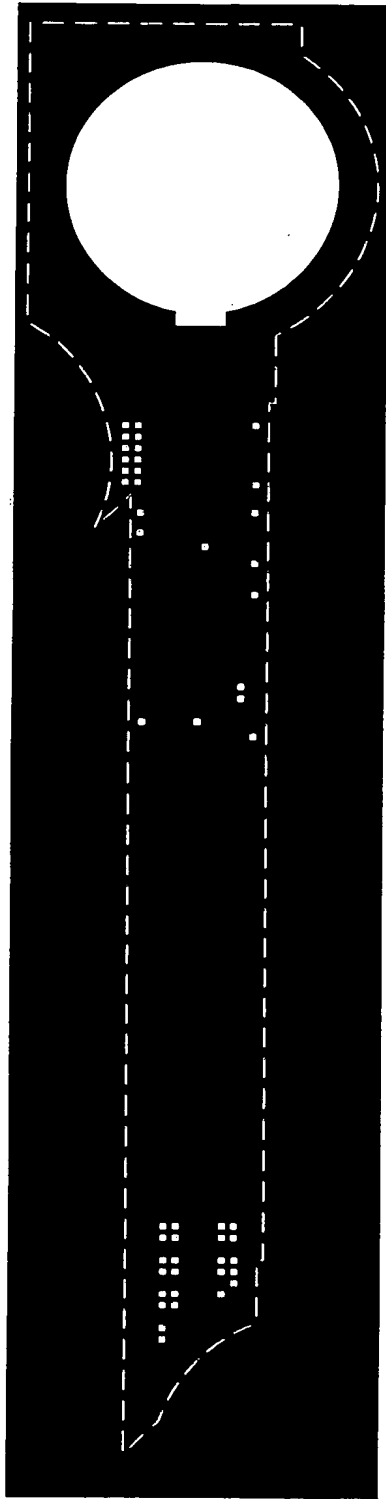


FIG. 40

Via 1 mask

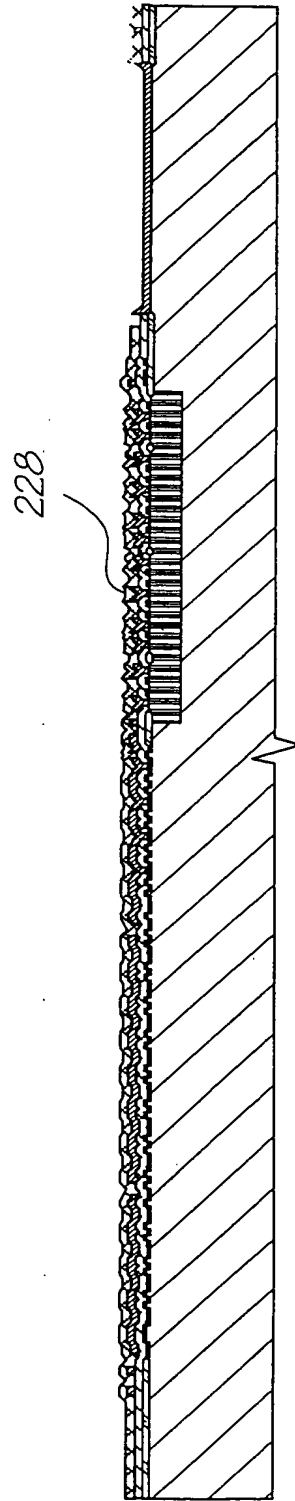
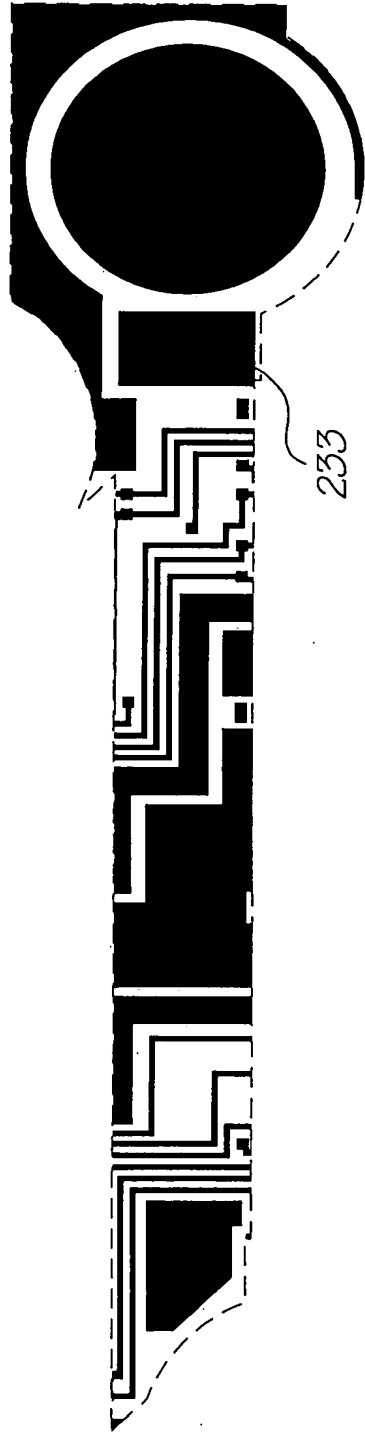


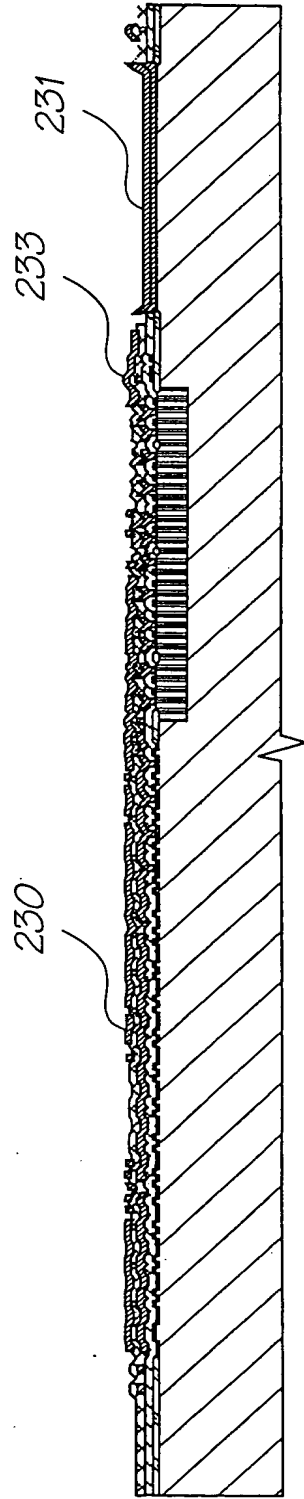
FIG. 41

Deposit ILD 2, etch vias



Metal 2 mask

FIG. 42



Deposit metal 2

FIG. 43

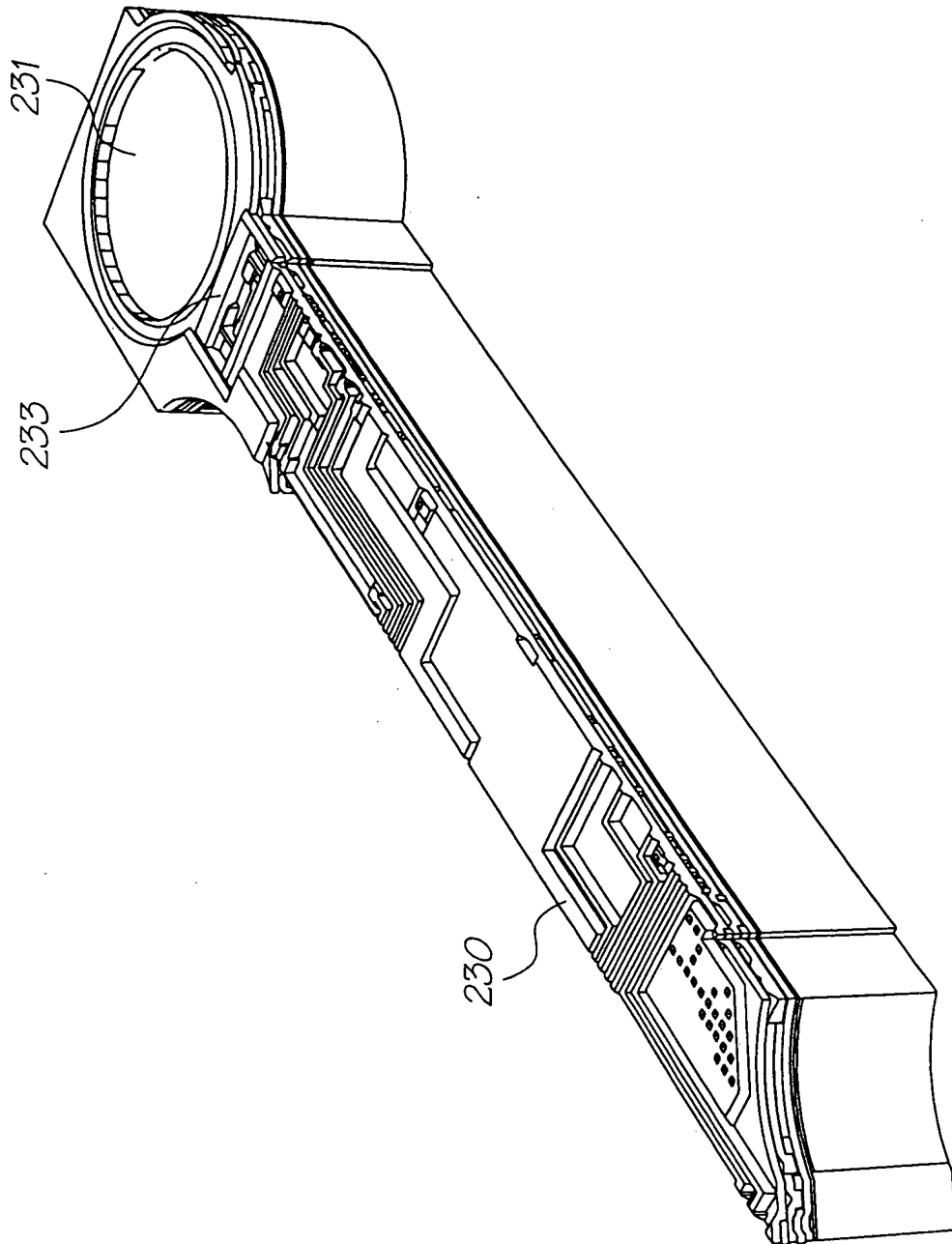


FIG. 44

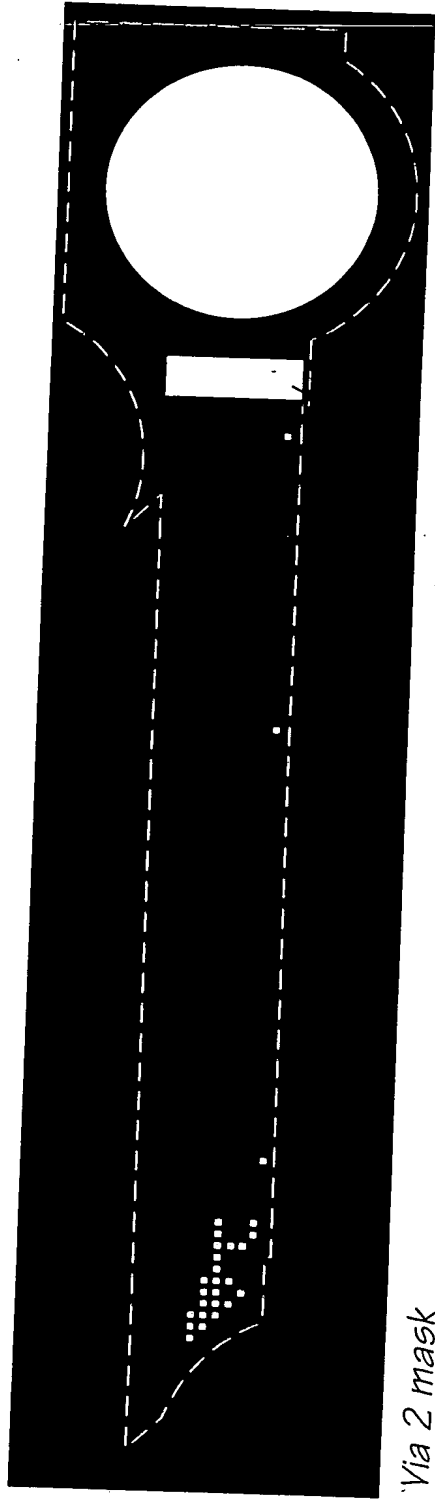


FIG. 45

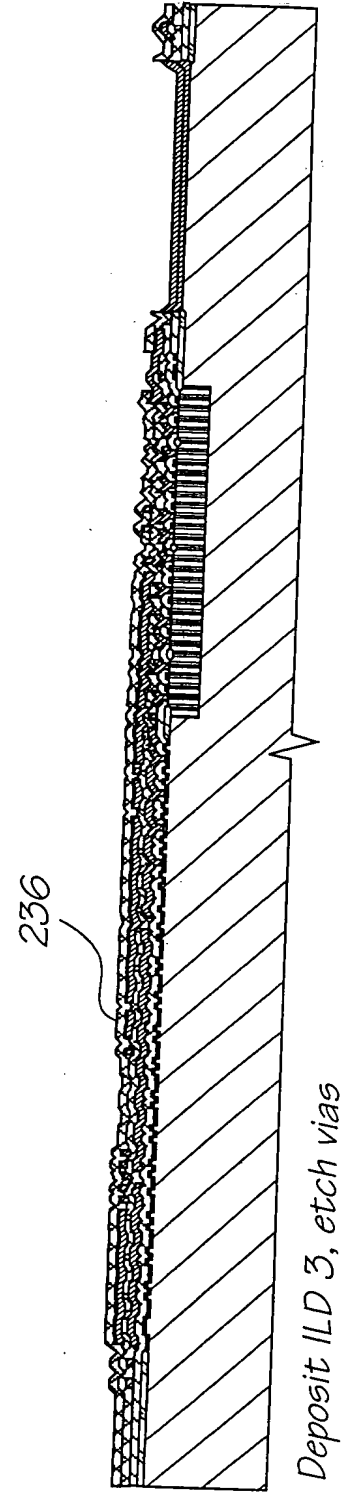
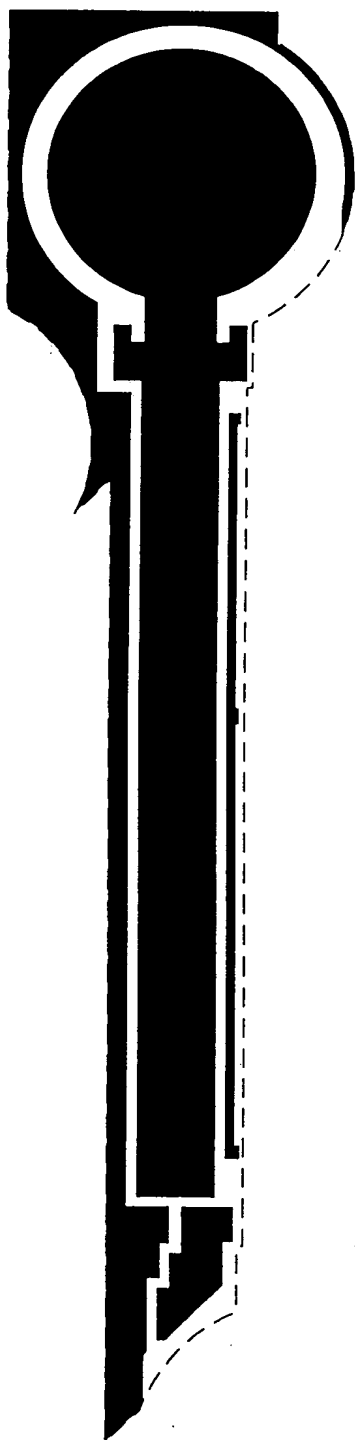
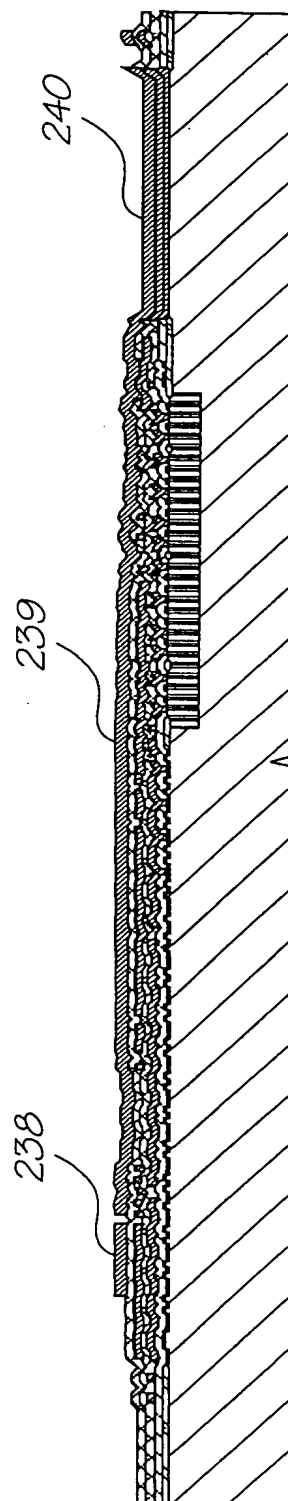


FIG. 46



Metal 3 mask

FIG. 47



Deposit metal 3

FIG. 48

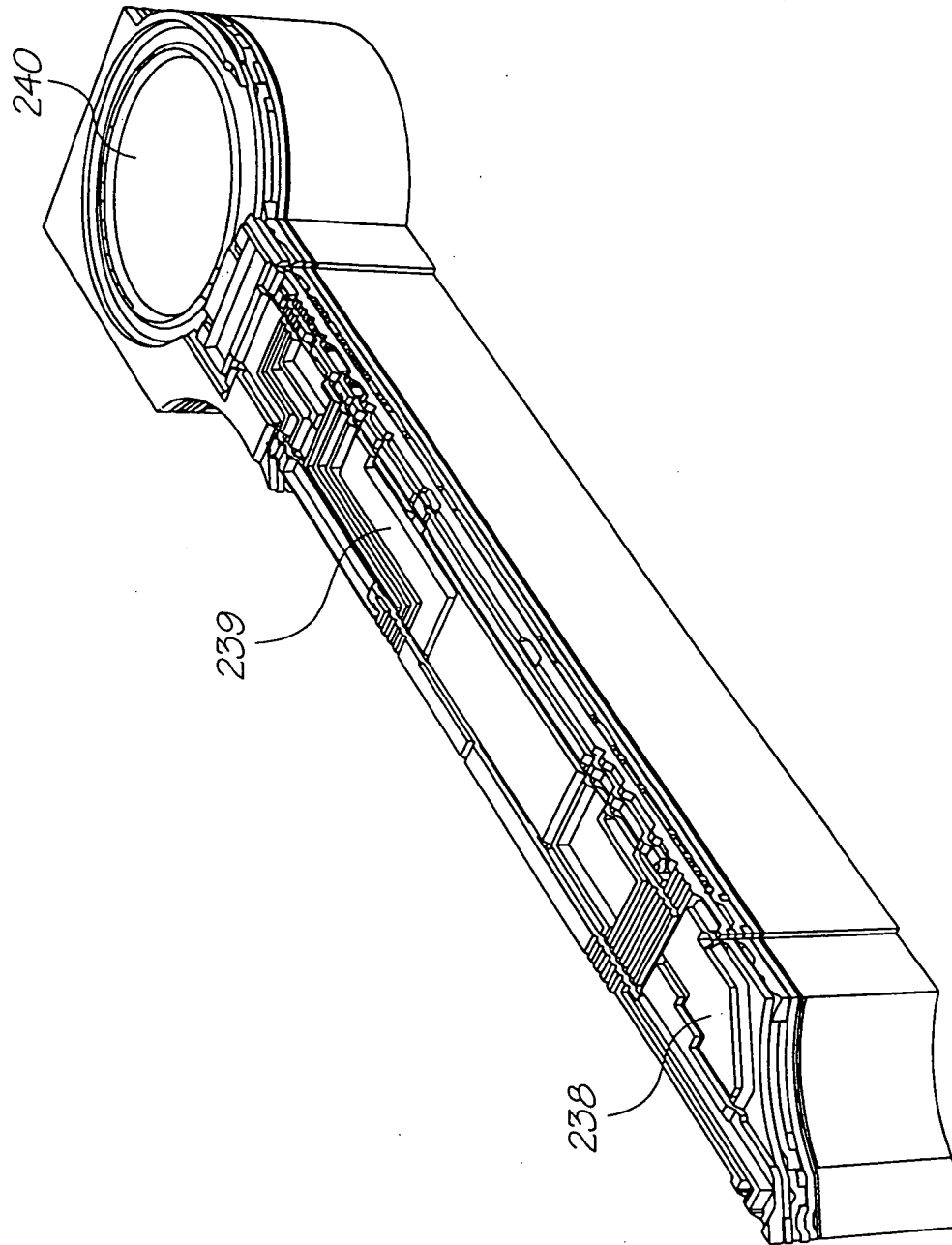
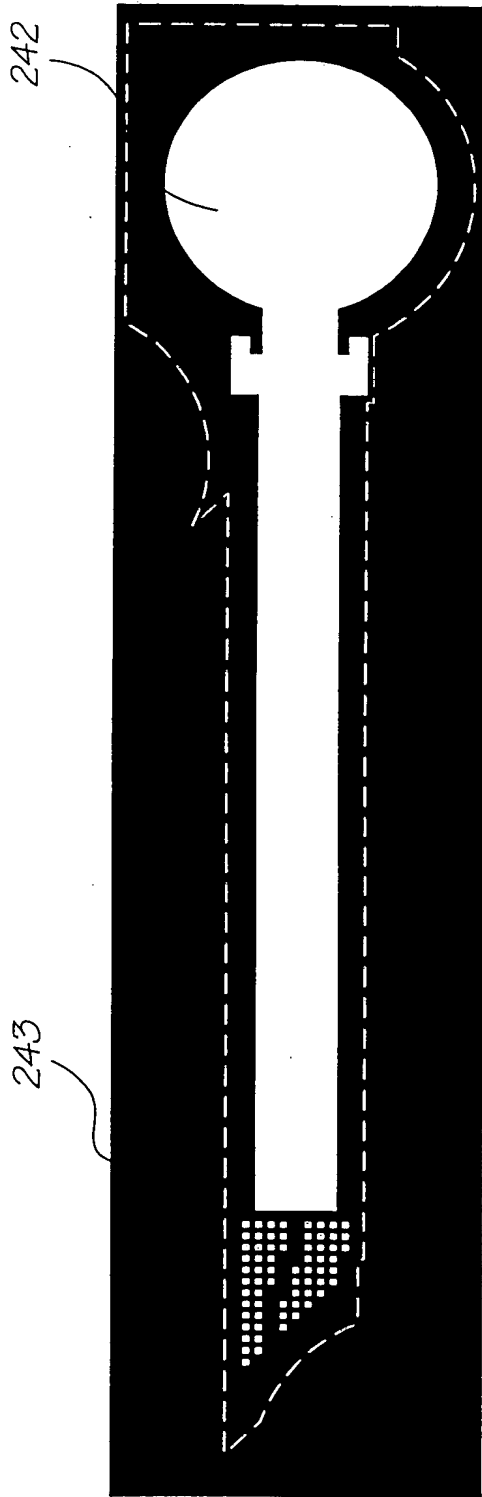
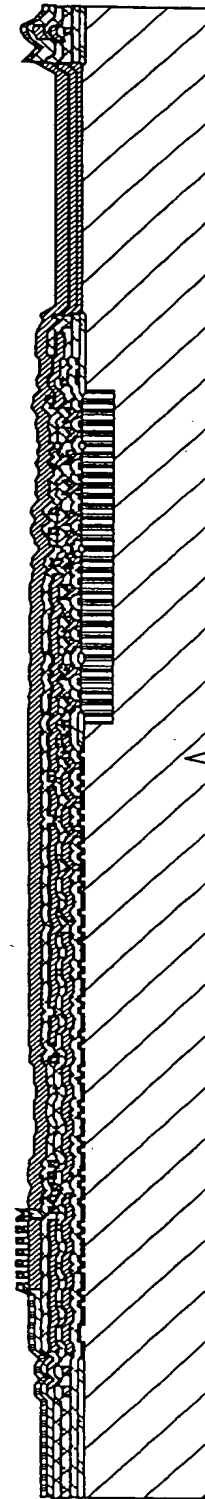


FIG. 49



Via 3 / Passivation mask

FIG. 50



Deposit passivation oxide & nitride, etch vias

FIG. 51



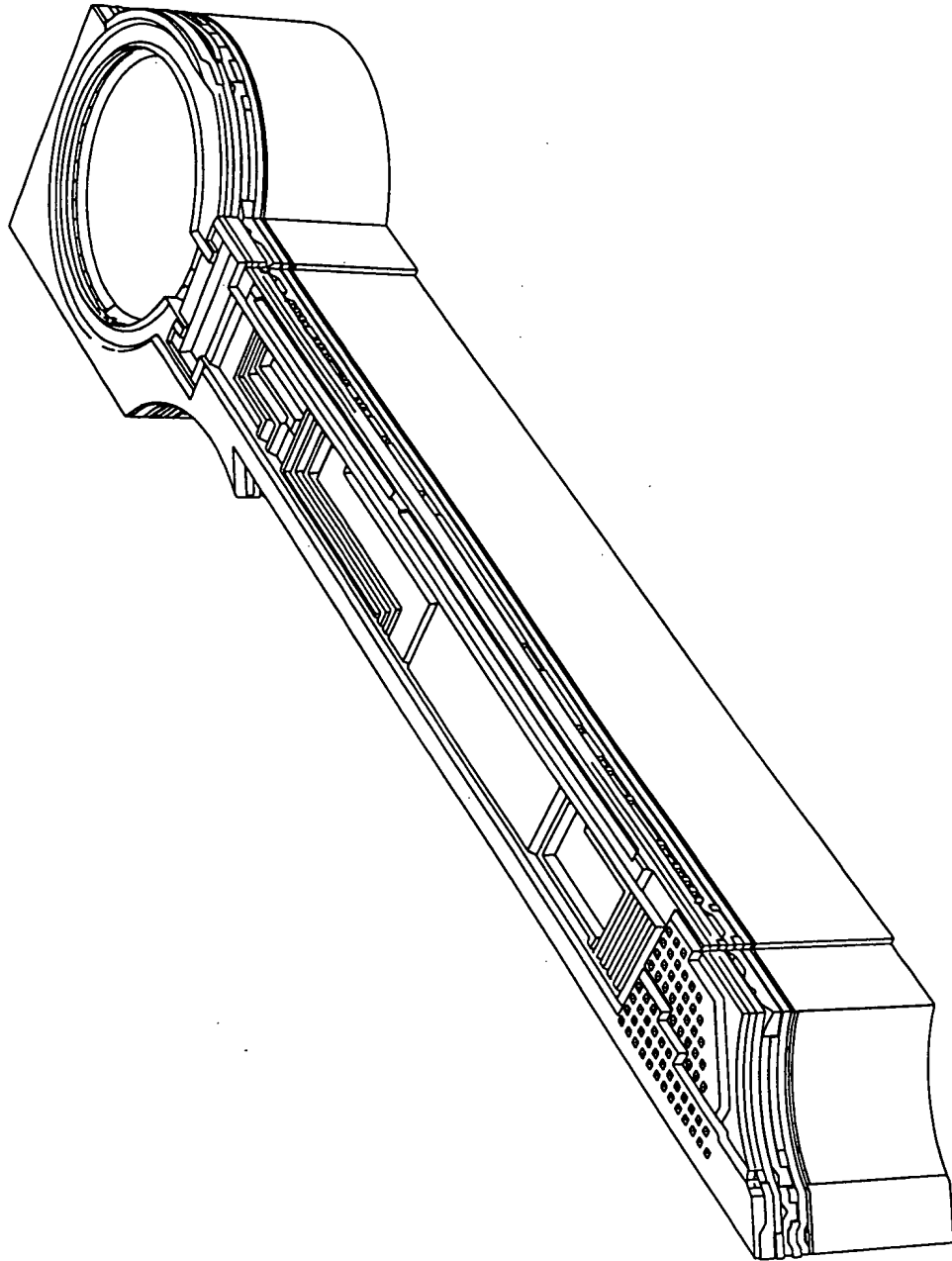
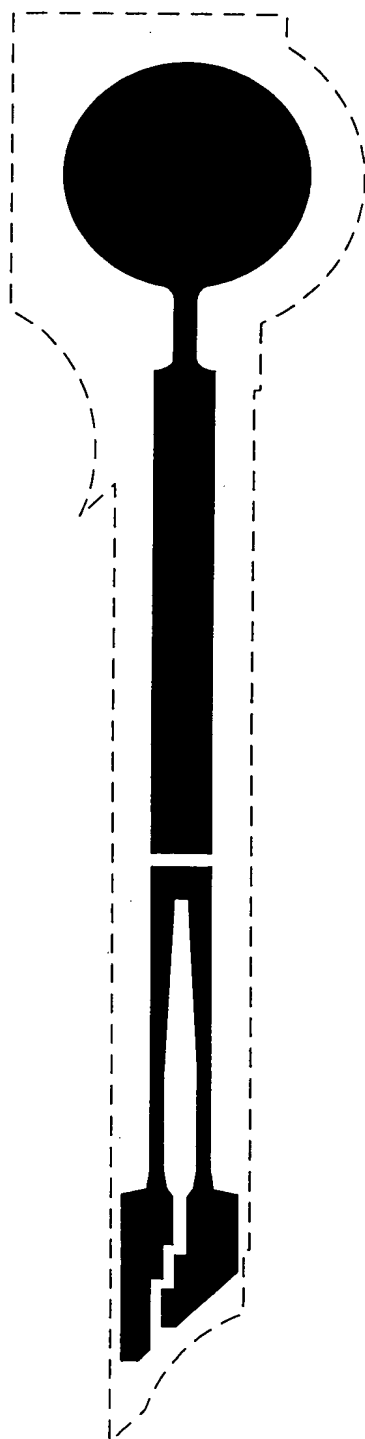


FIG. 52



Heater mask

FIG. 53

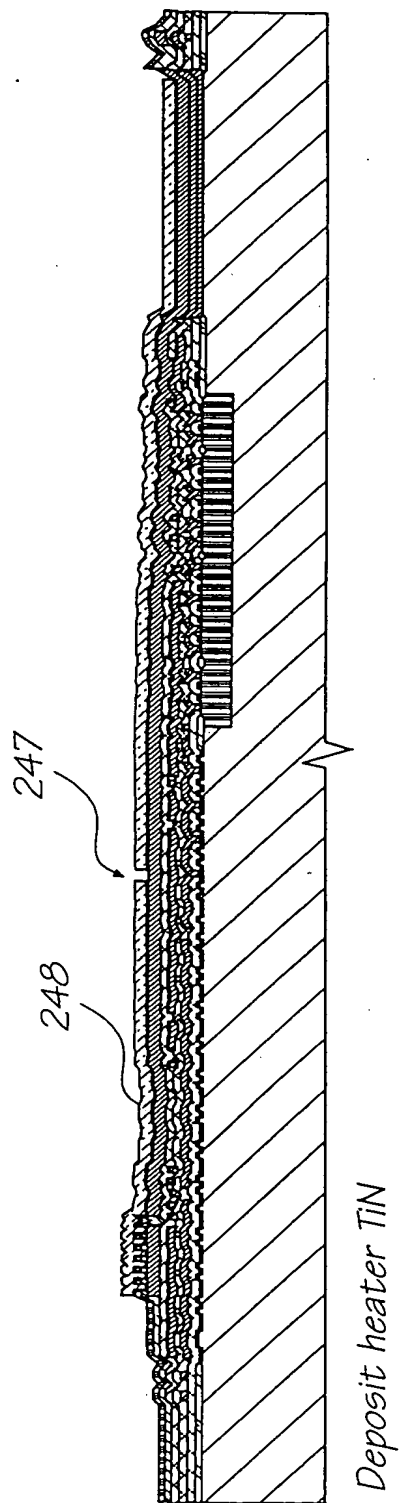


FIG. 54

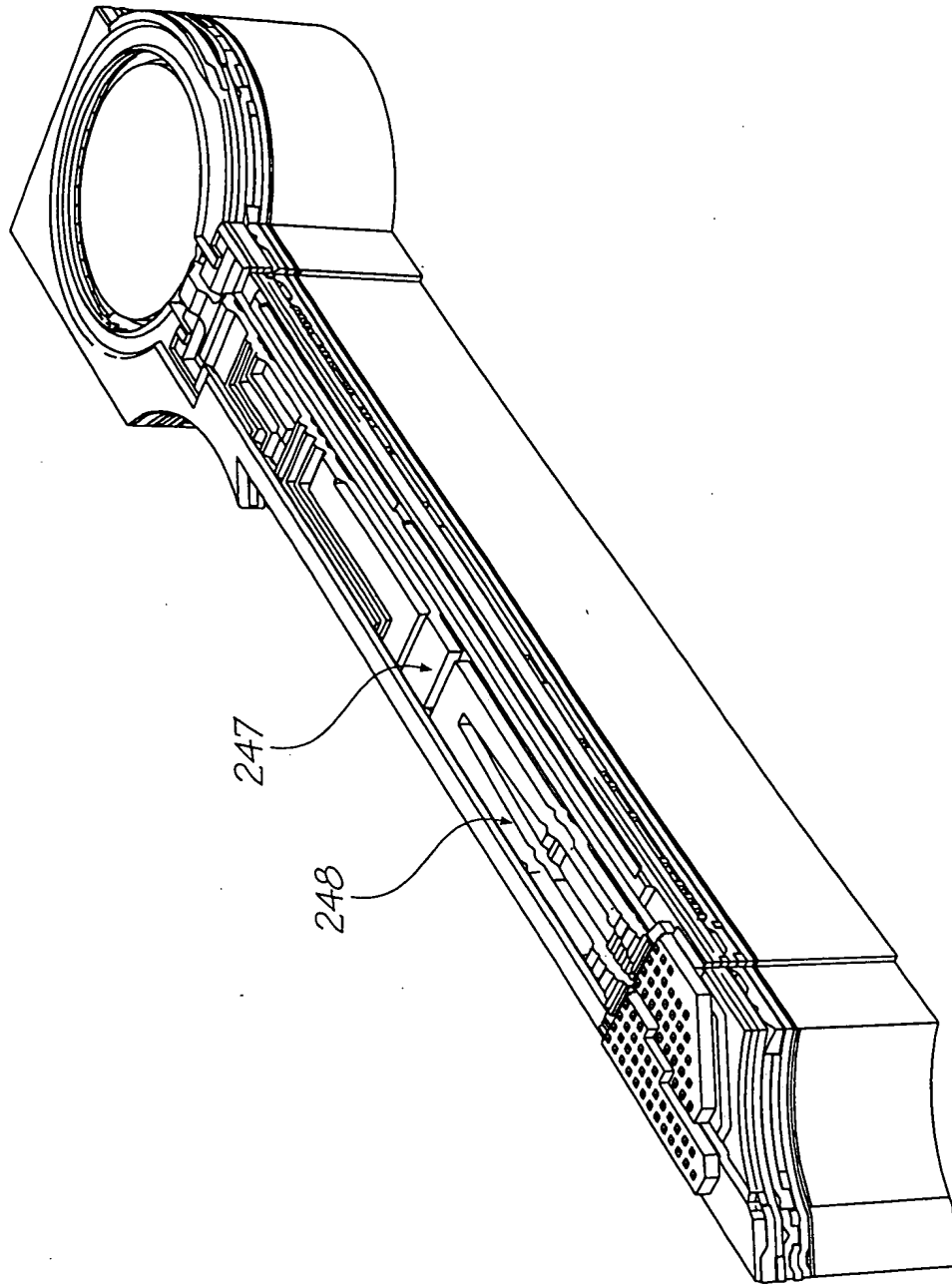
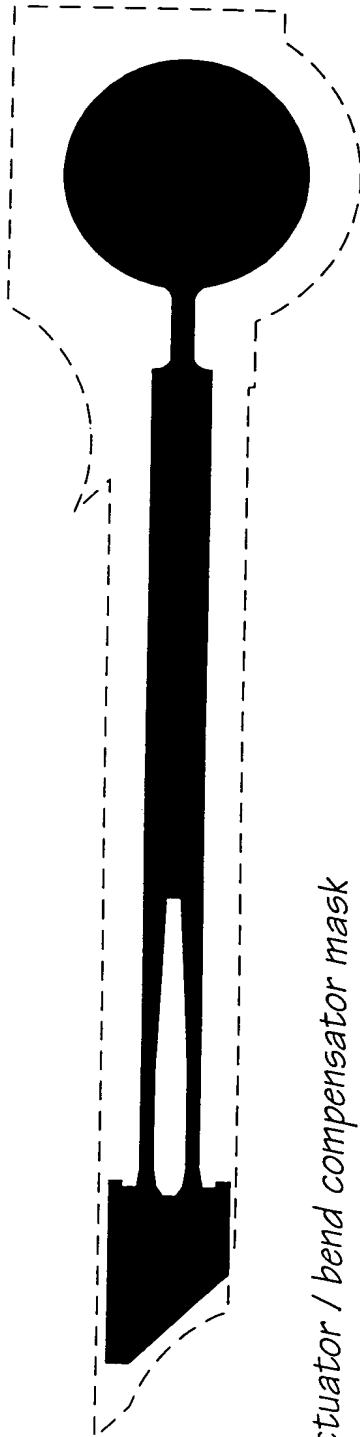
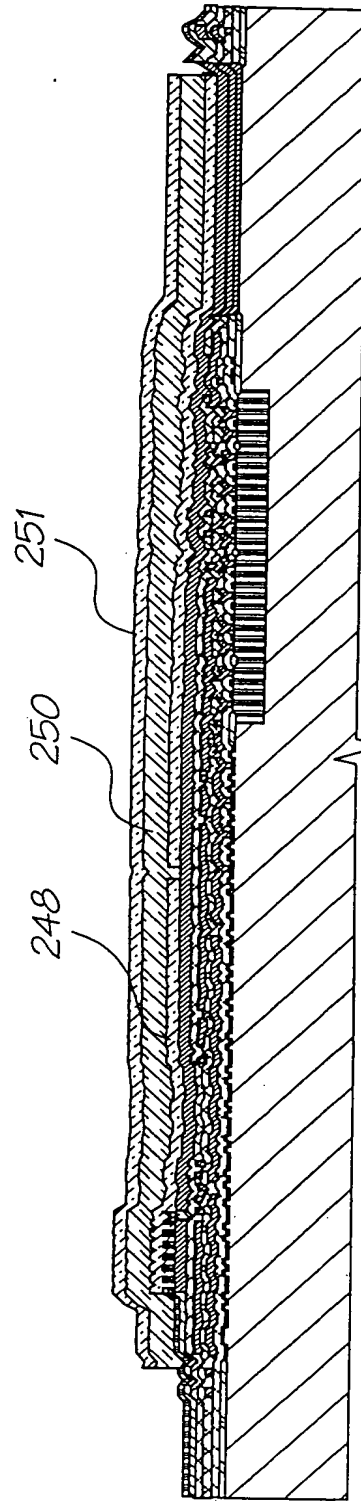


FIG. 55



Actuator / bend compensator mask

FIG. 56



Deposit actuator glass and bend compensator TiN, etch together

FIG. 57

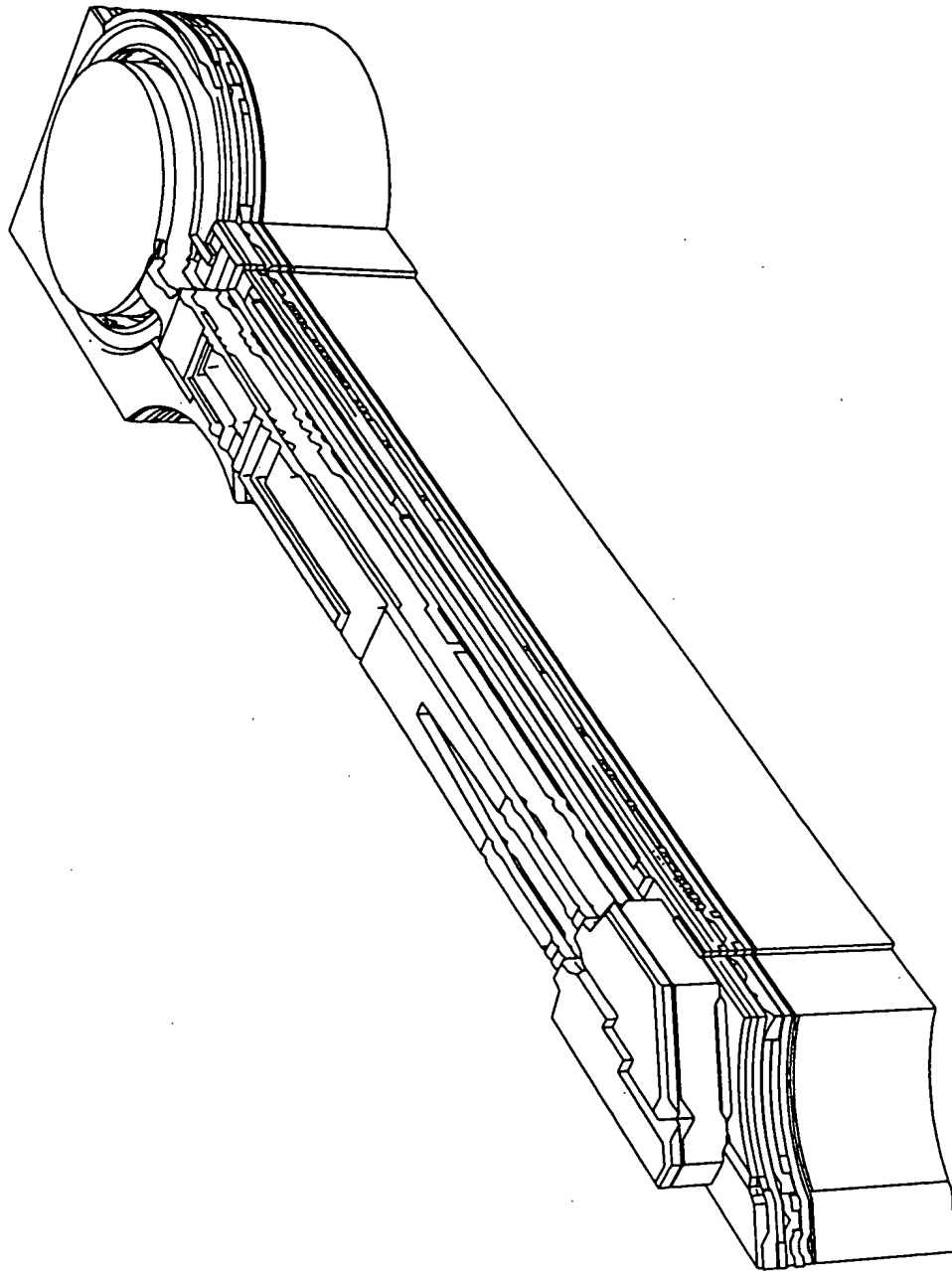
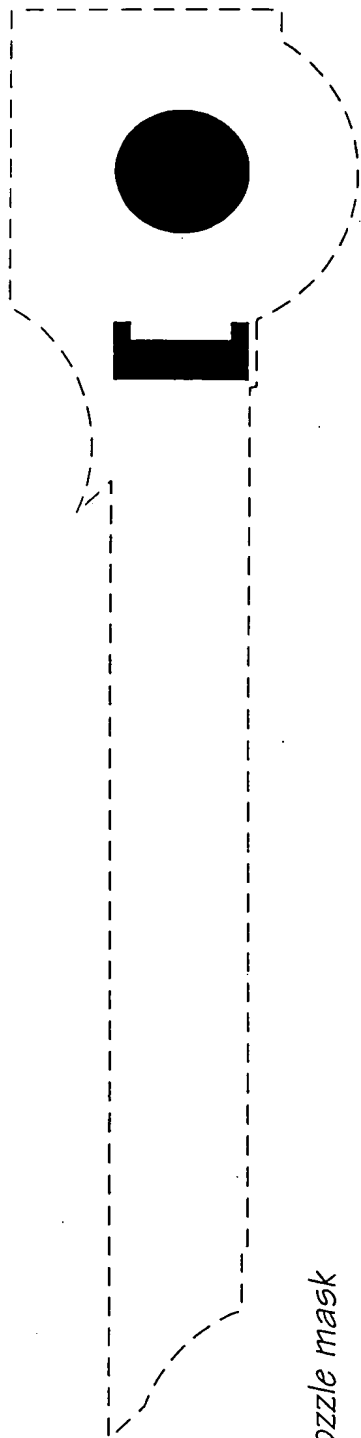


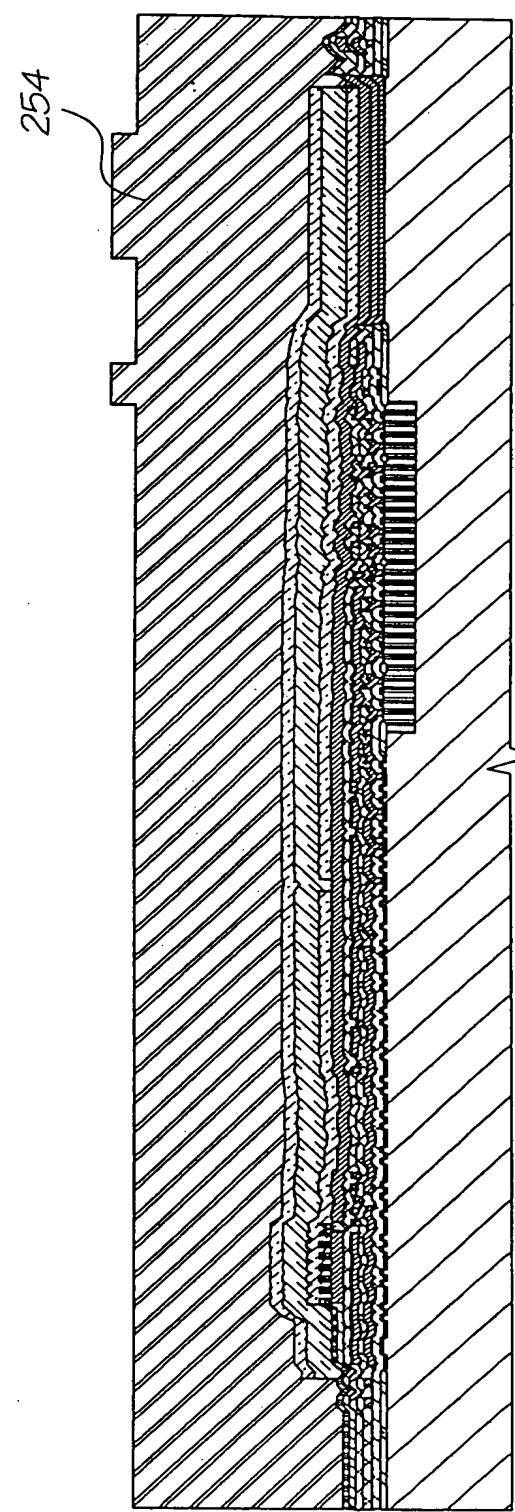
FIG. 58



Nozzle mask

FIG. 59

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Deposit sacrificial layer, etch nozzles

FIG. 60

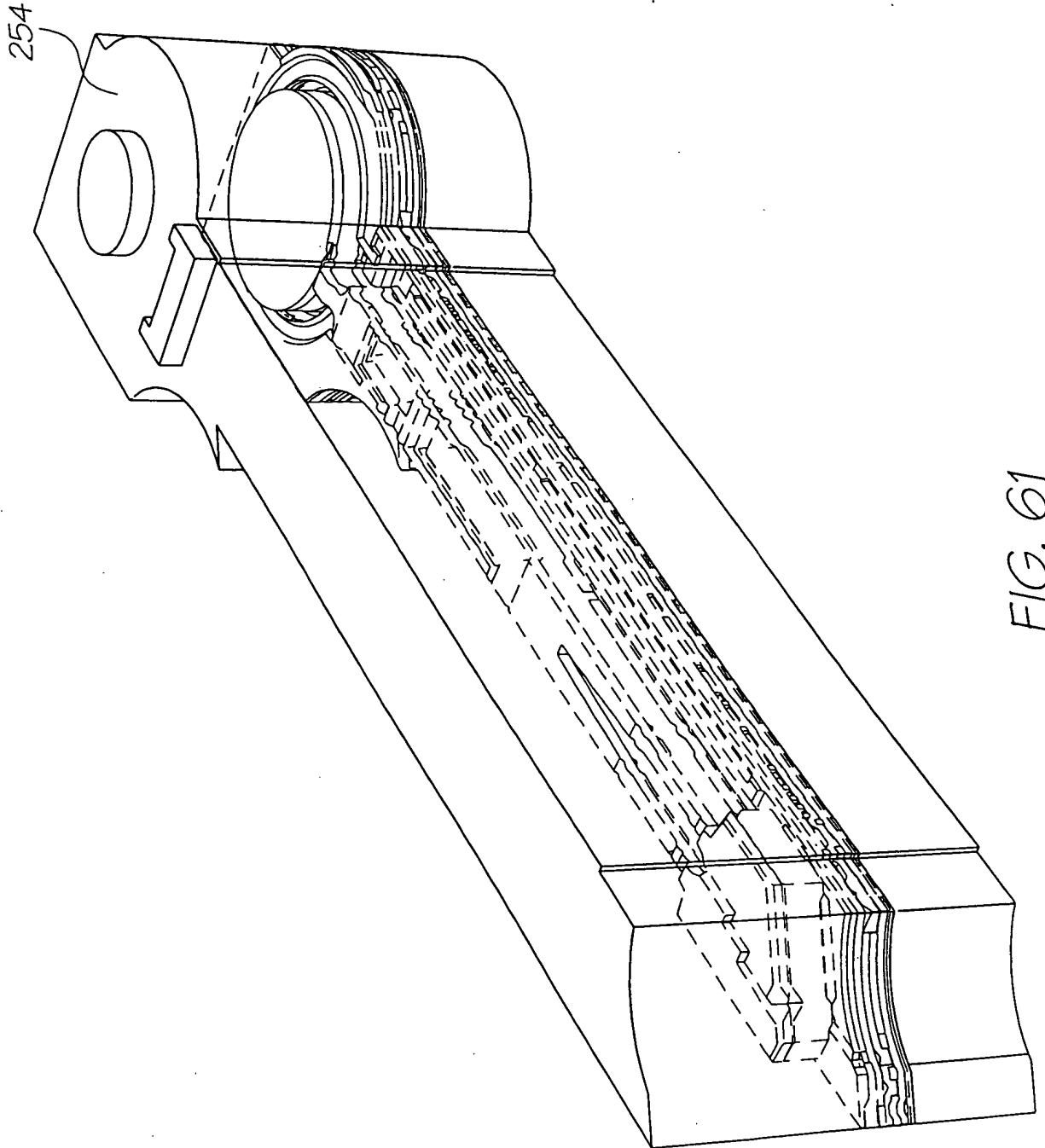
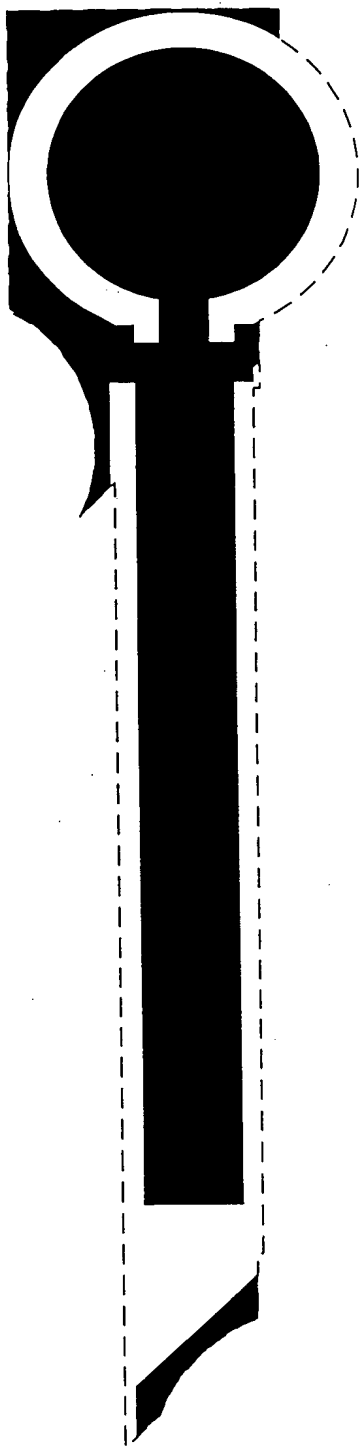


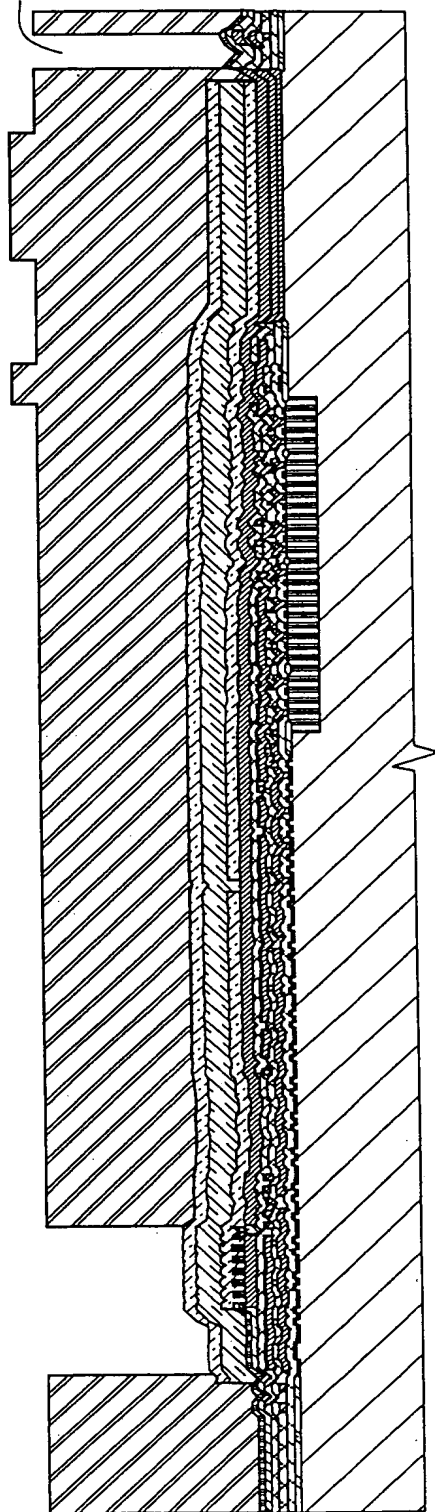
FIG. 61



Chamber mask

FIG. 62

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255



Etch chambers in sacrificial layer

FIG. 63



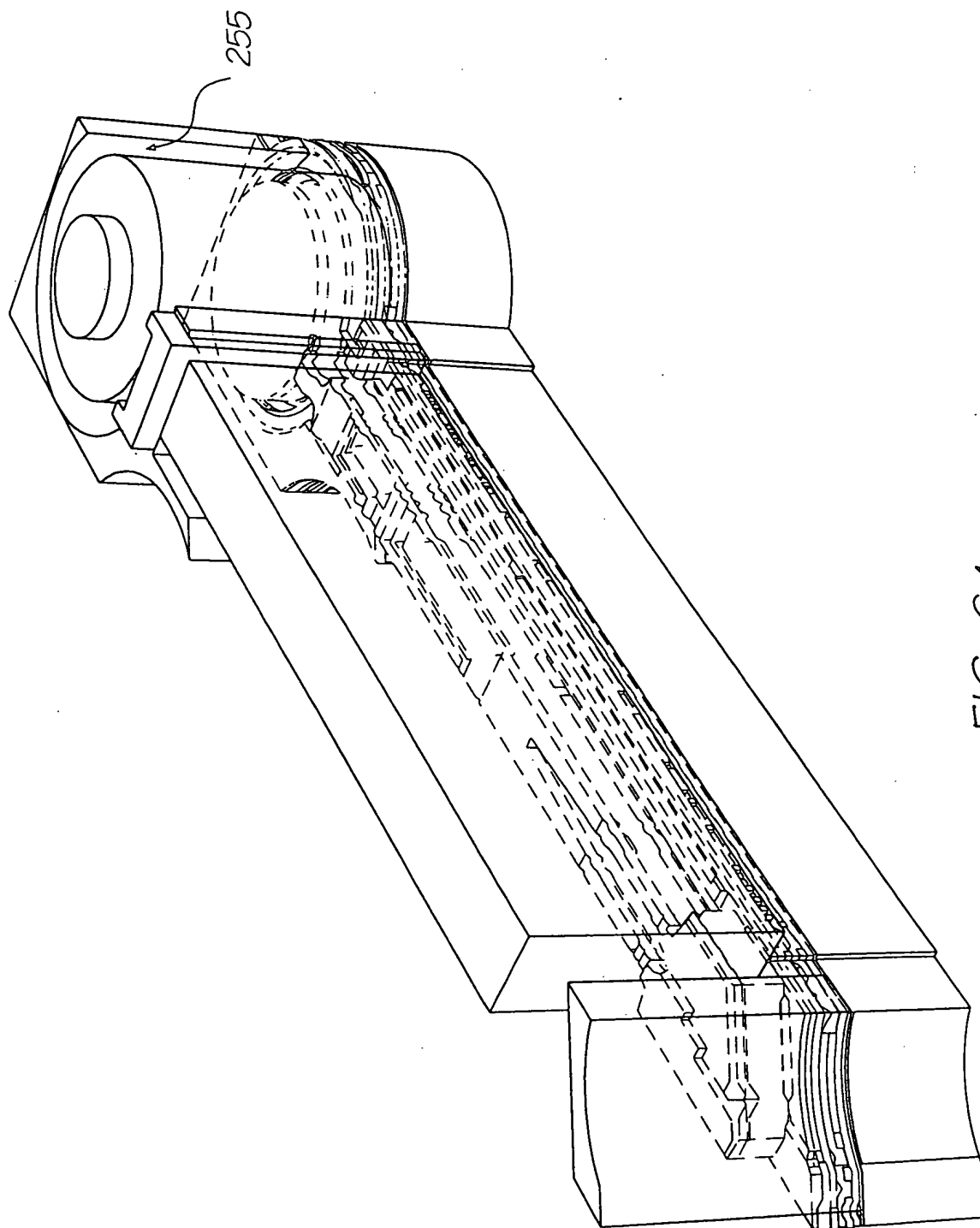
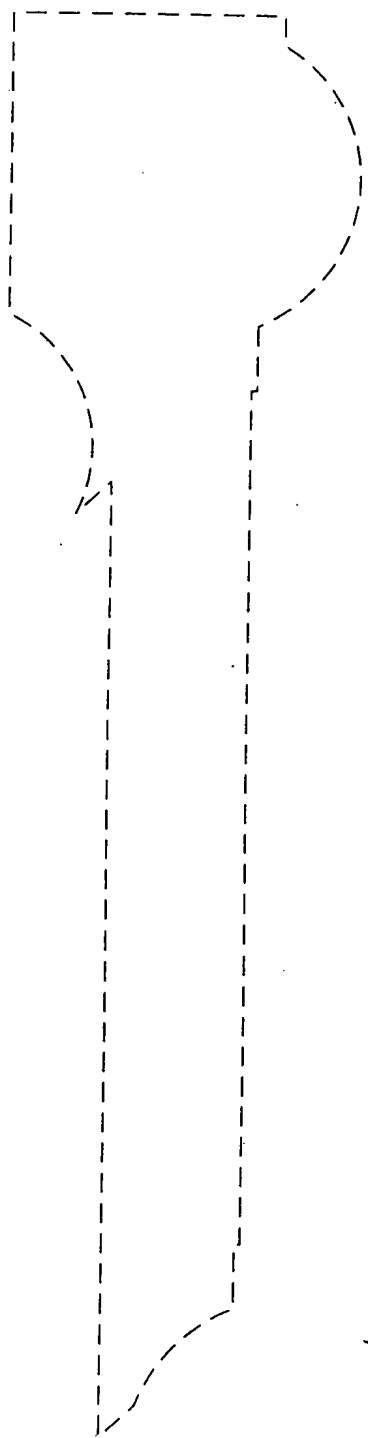
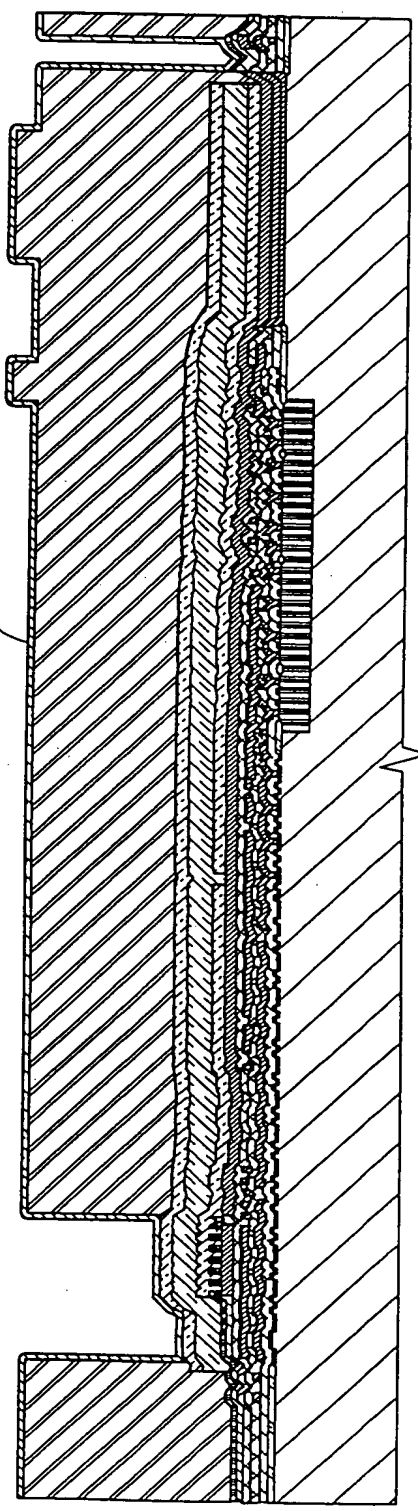


FIG. 64



No mask

257



Deposit chamber walls

FIG. 65

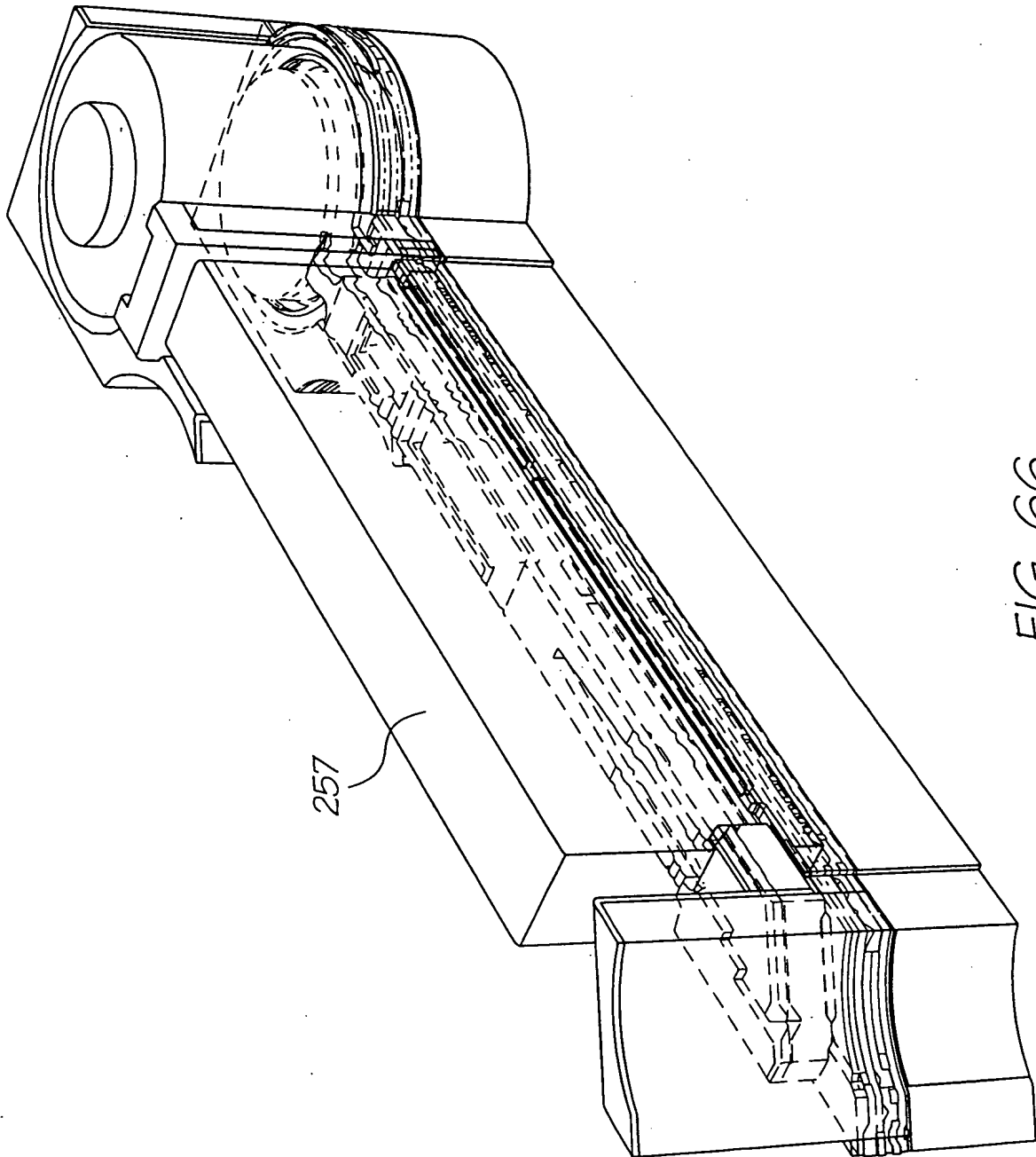
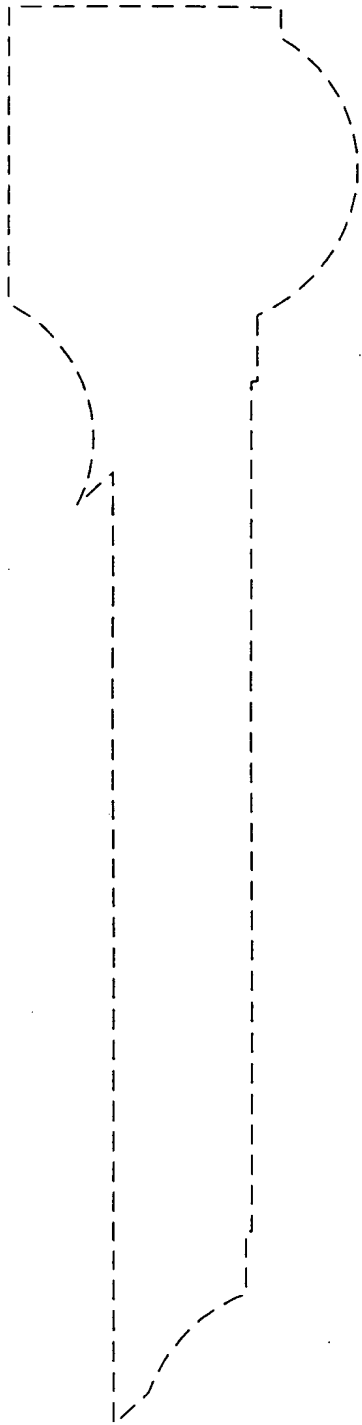
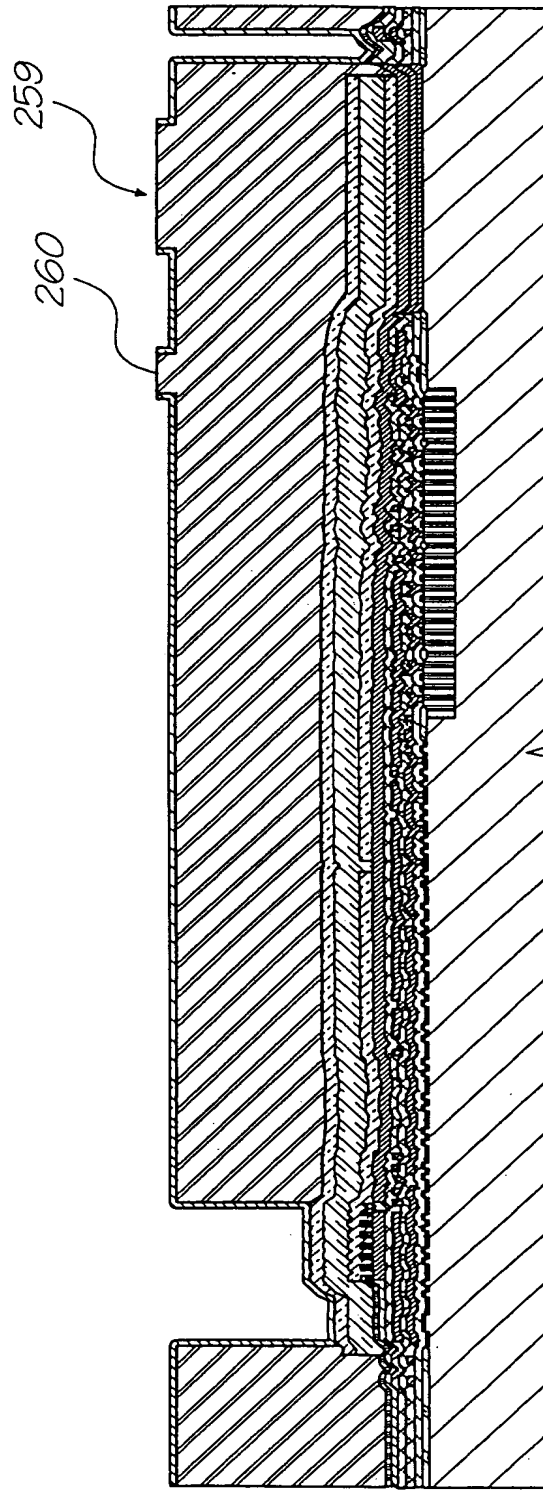


FIG. 66



No mask



Form self-aligned nozzles using CMP

FIG. 67

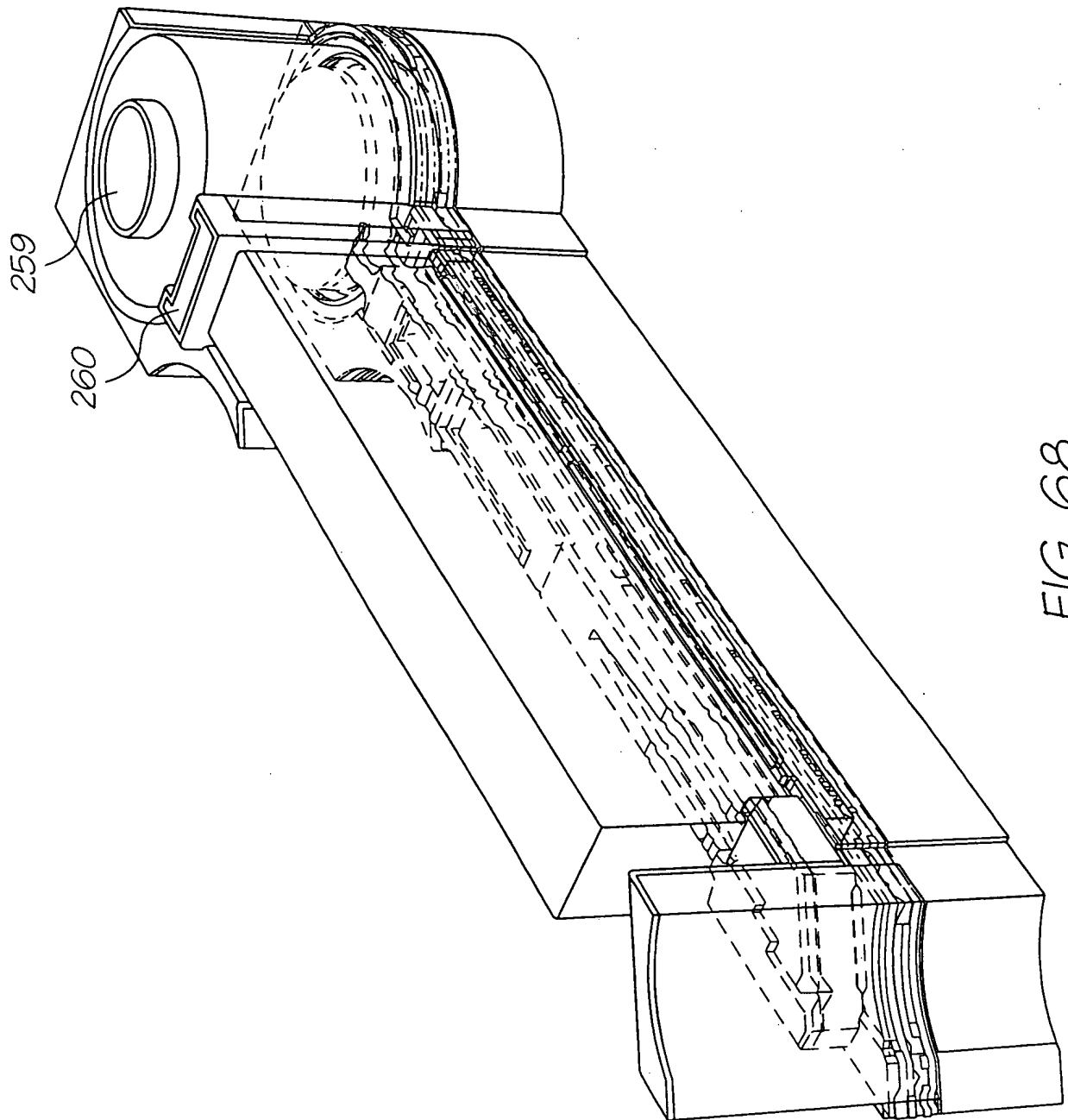
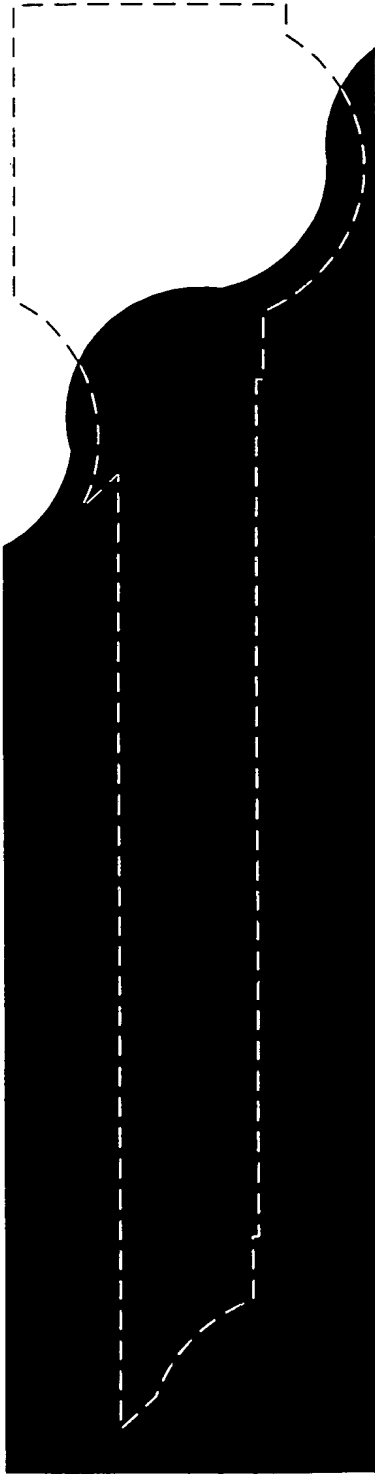
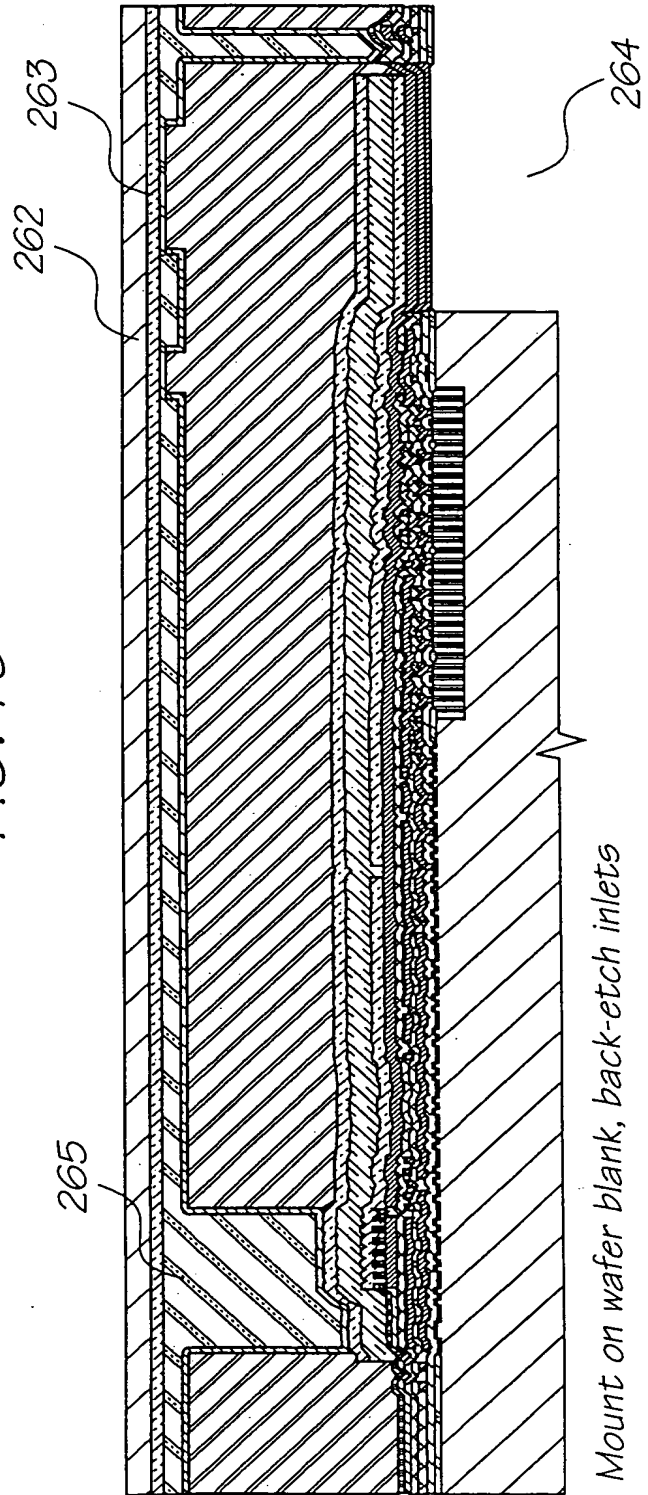


FIG. 68



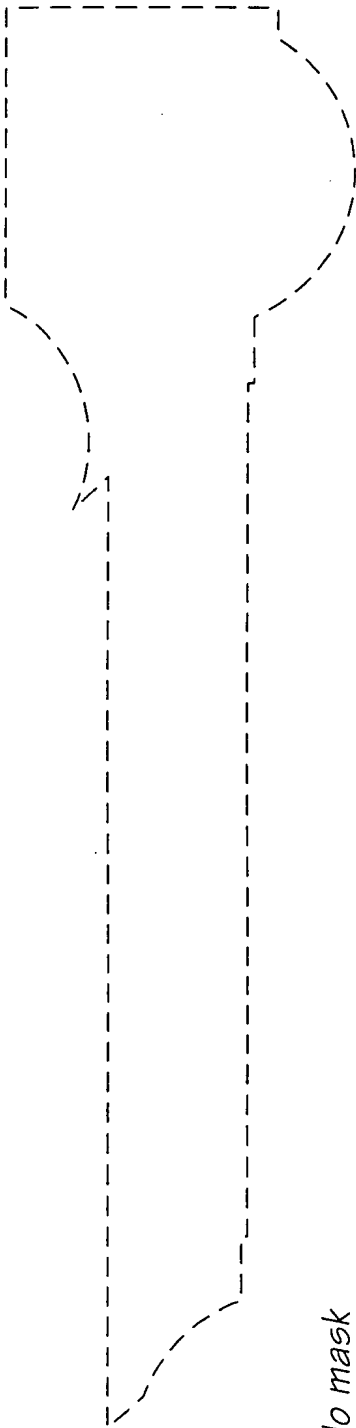
Back-etch inlet mask

FIG. 70

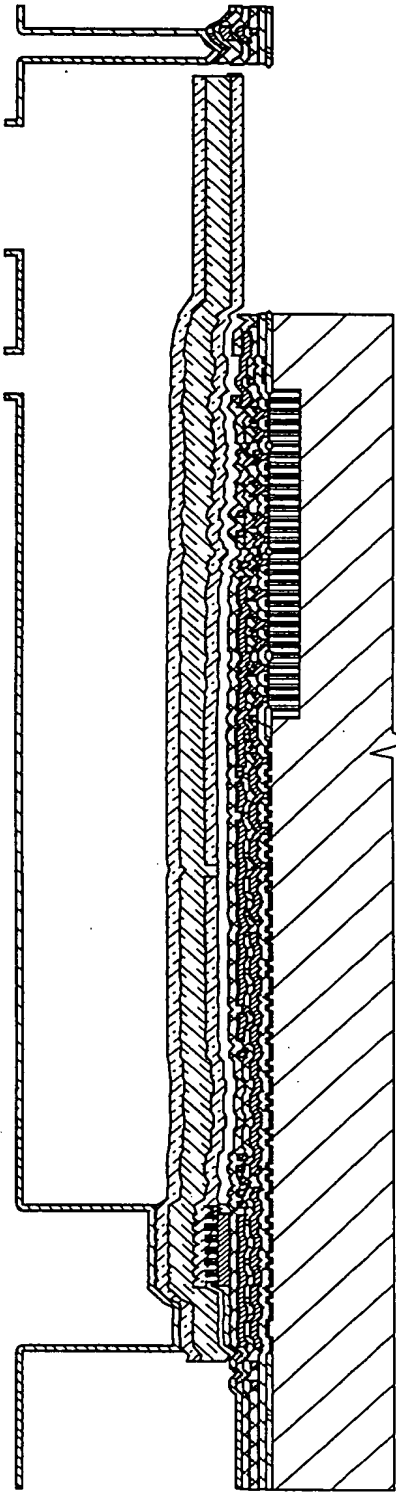


Mount on wafer blank, back-etch inlets

FIG. 69



No mask



Detach from wafer blank, etch sacrificial material

FIG. 71

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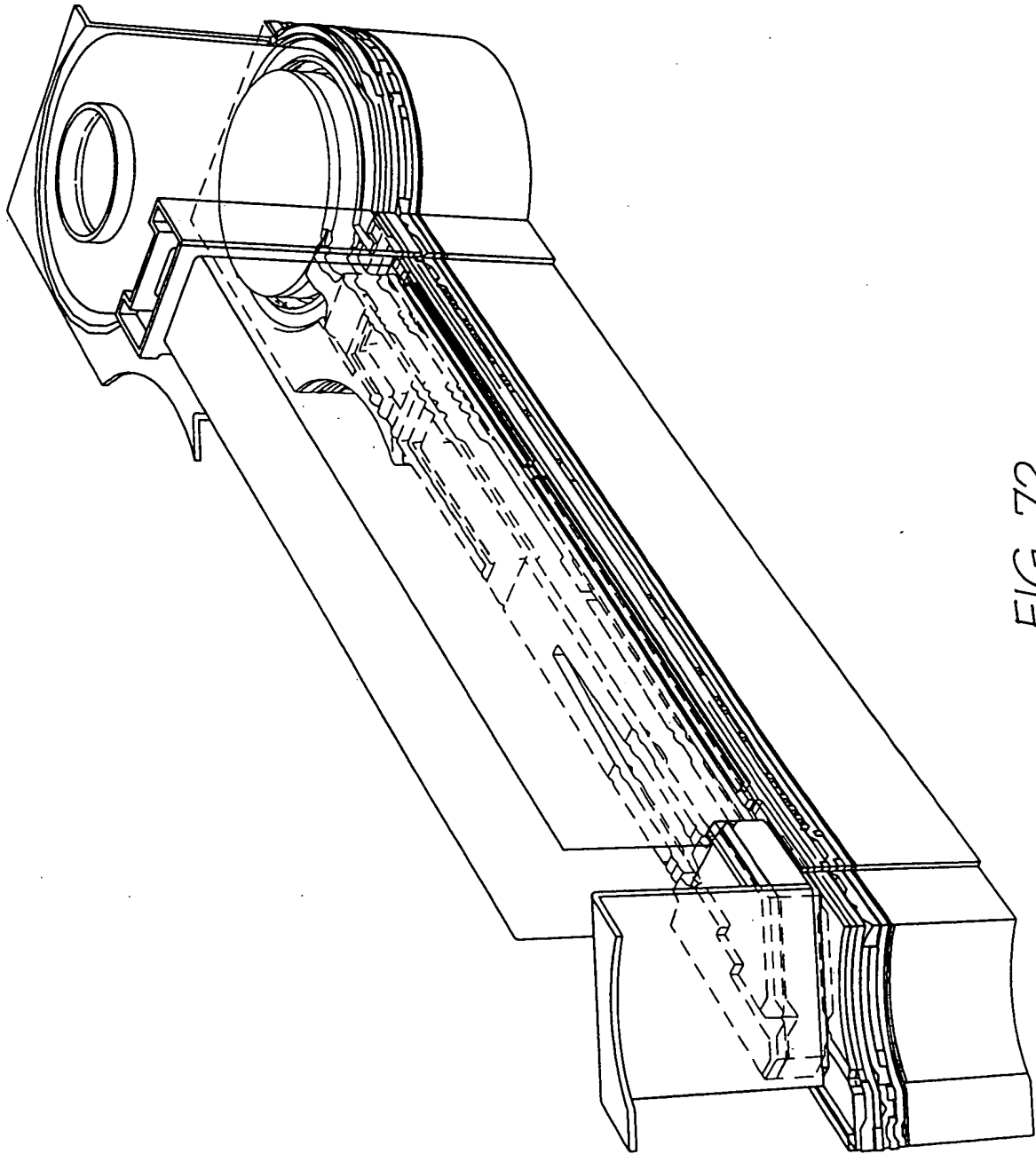


FIG. 72



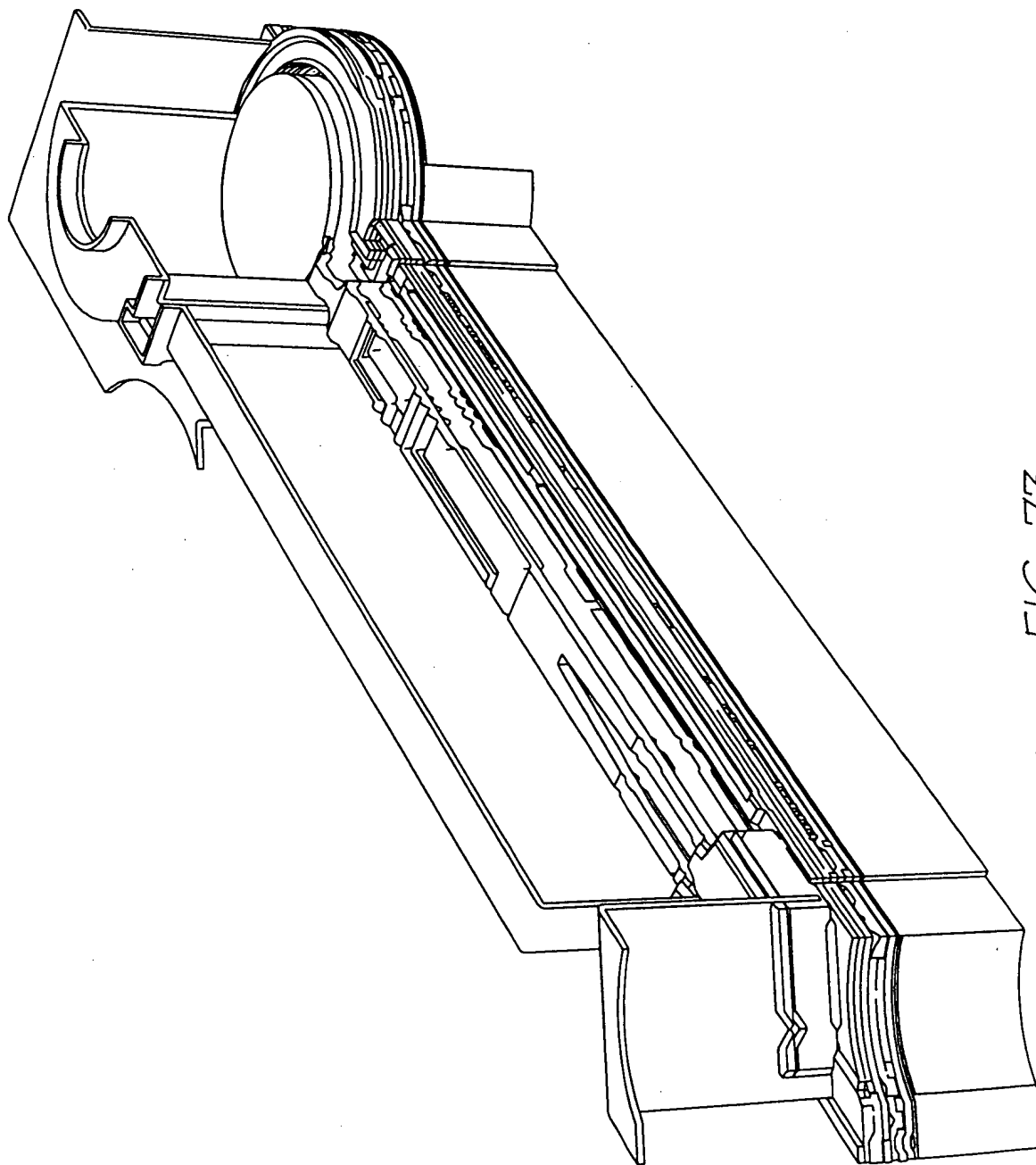
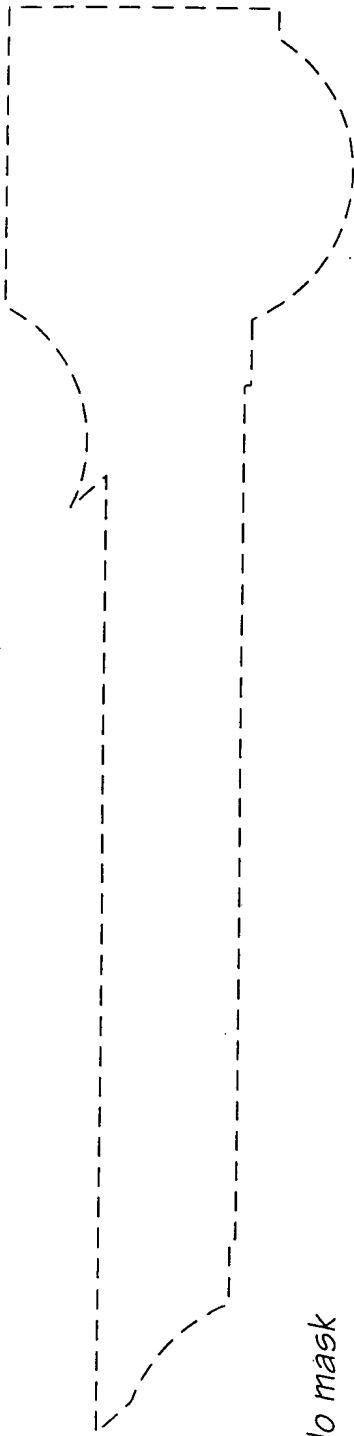
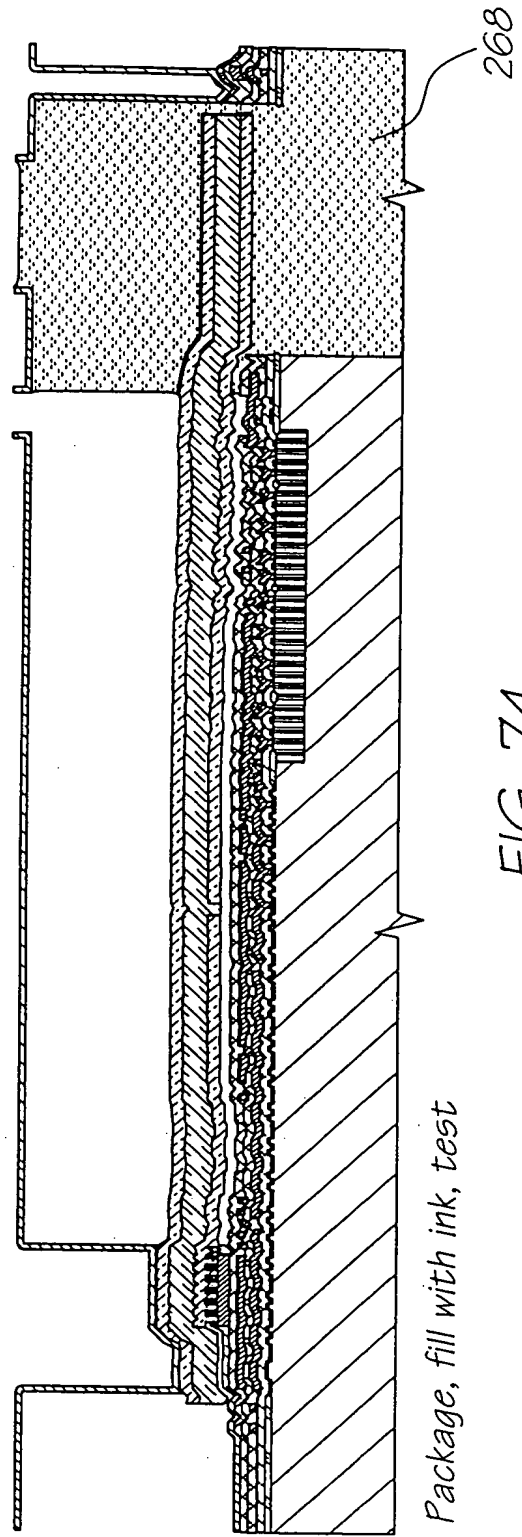


FIG. 73



No mask



Package, fill with ink, test

FIG. 74

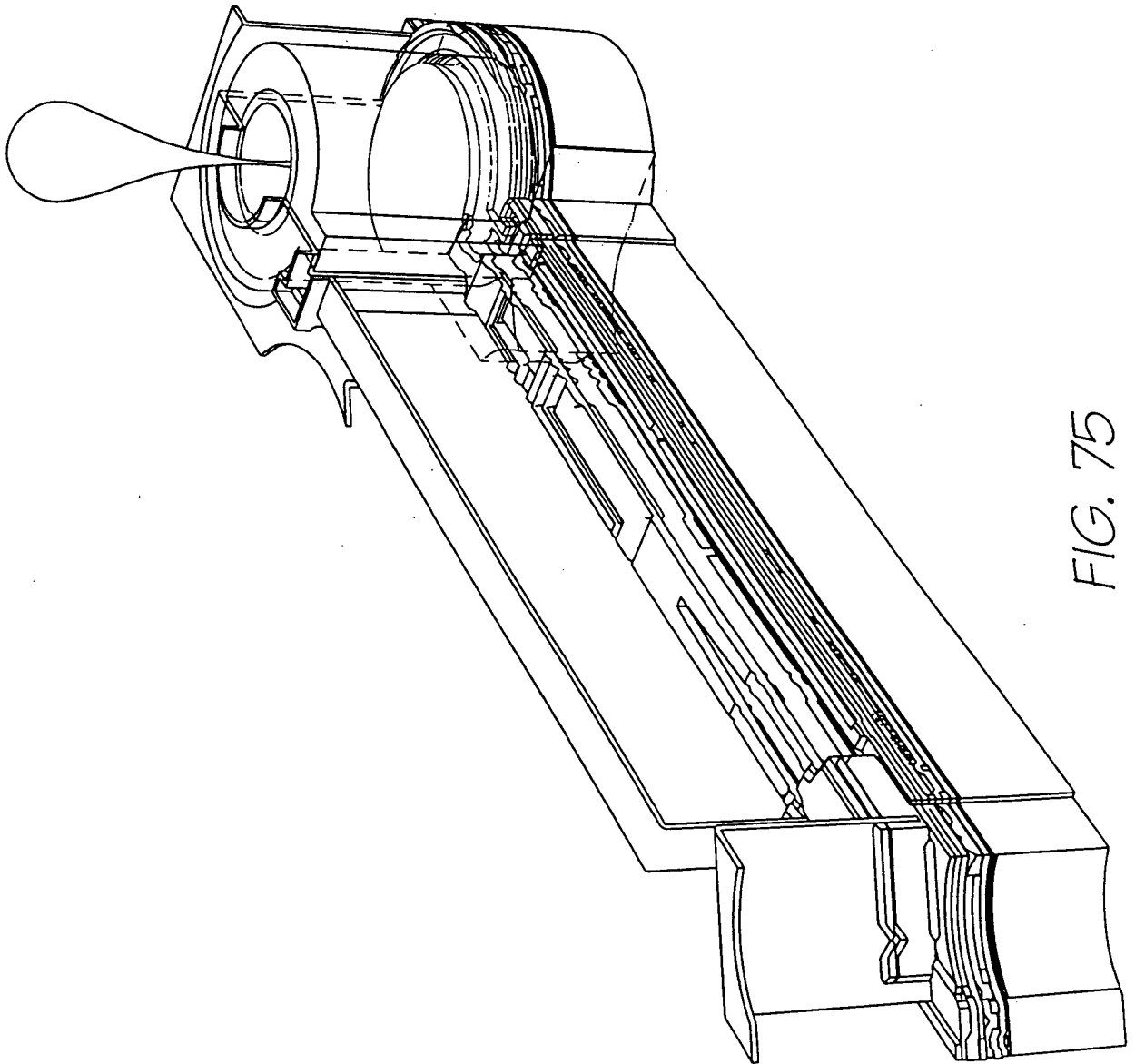


FIG. 75

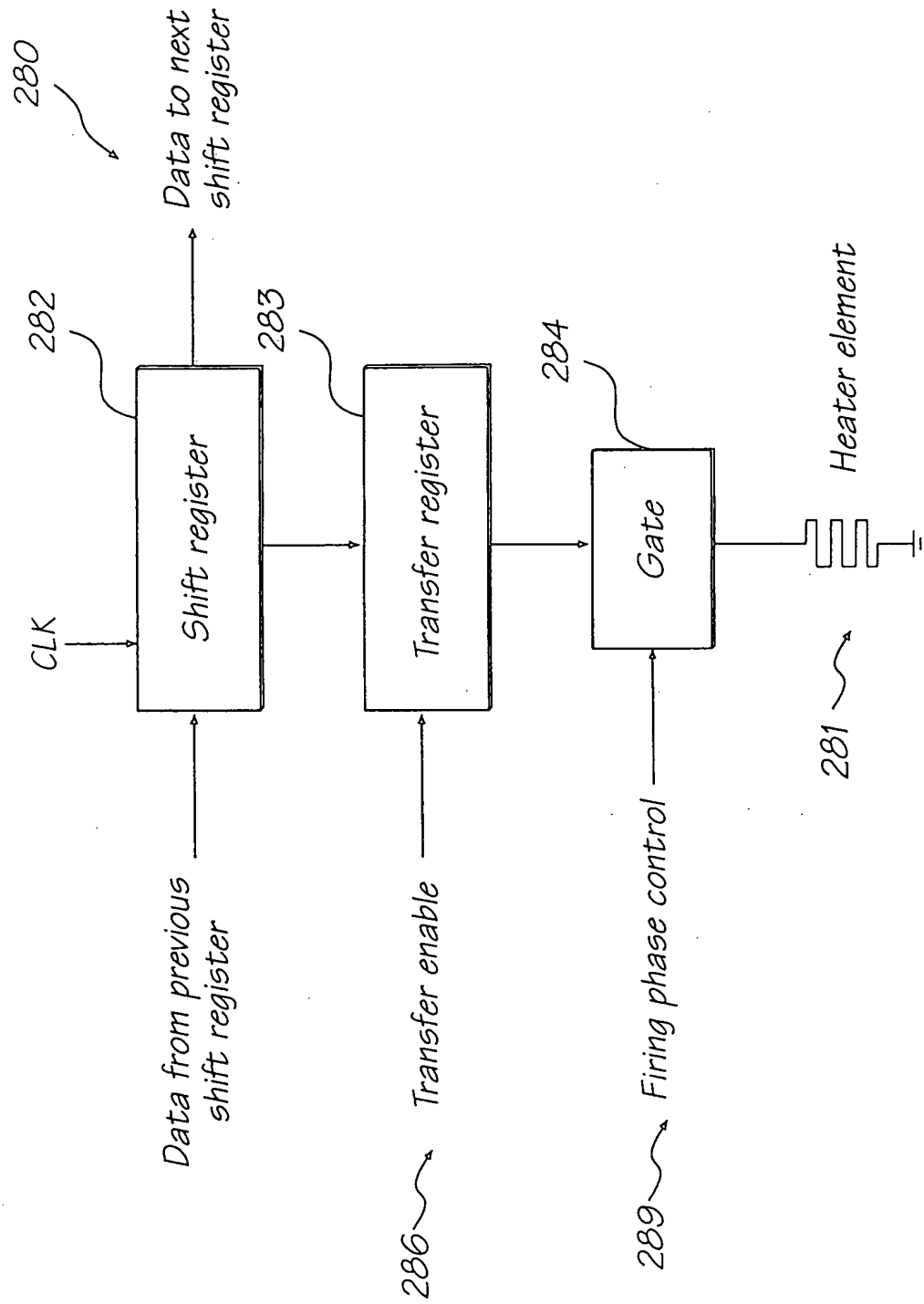


FIG. 76

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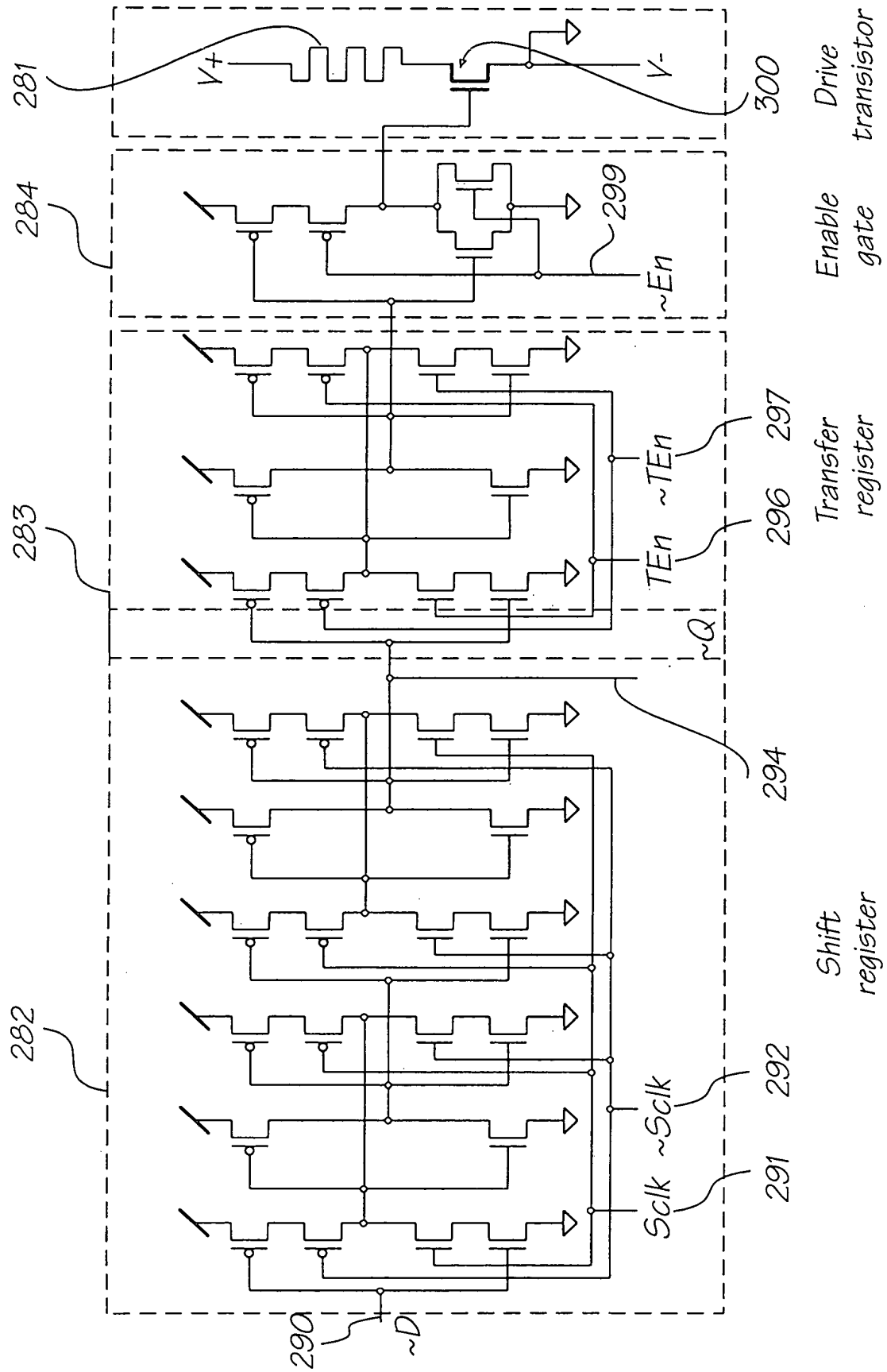


FIG. 77

Key



























	Silicon		Poly		Via 2		Actuator TiN		Cyan Ink
	Contacts		Contacts		Metal 3		Actuator Glass		Magenta Ink
	Active		Metal 1		Via 3		Compensator TiN		Yellow Ink
	p+		Via 1				Sacrificial		
	n+		Metal 2				Sacrificial-nozzle		
									Floor
									Wall
									Roof
									Rim
									Shroud

FIG. 78

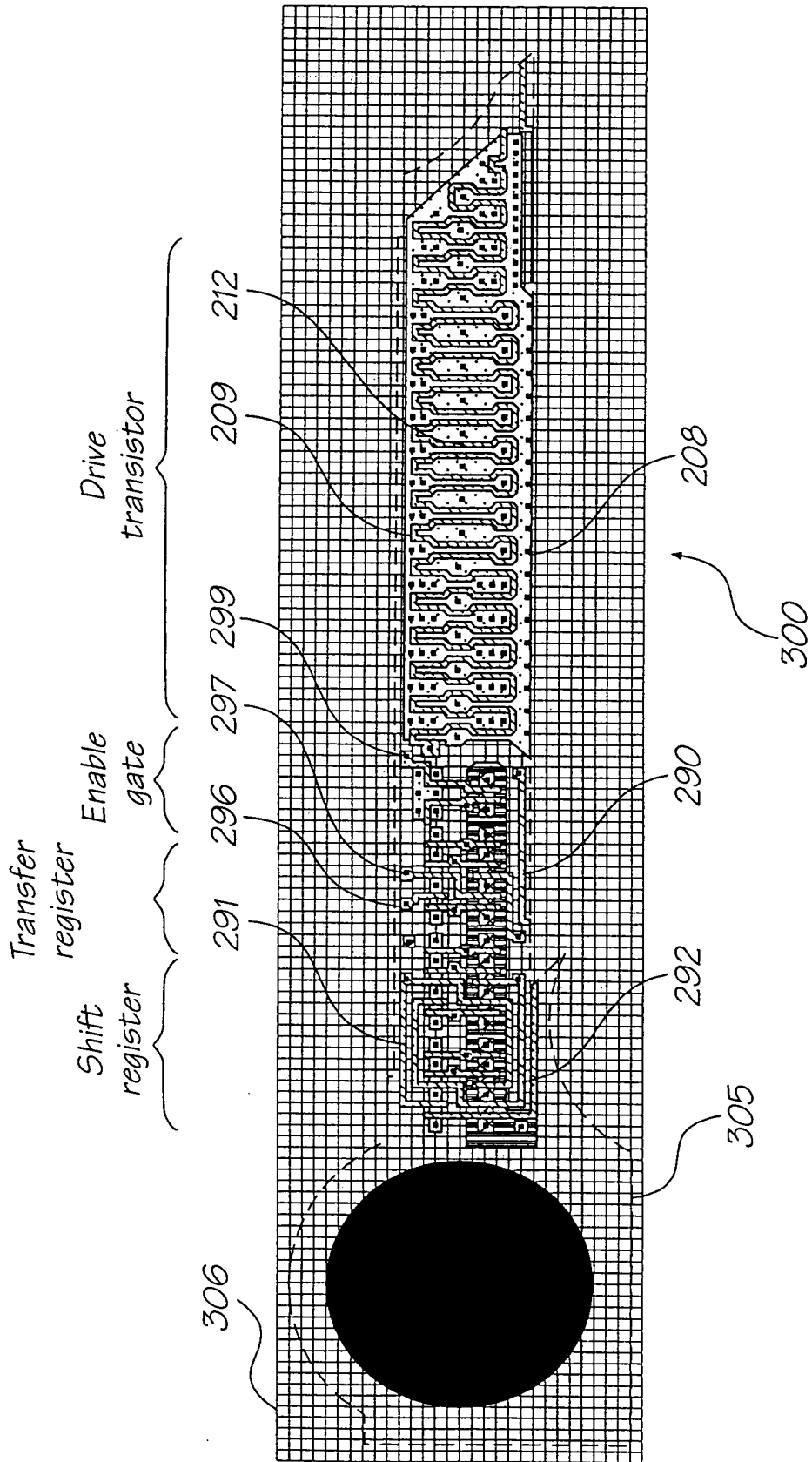


FIG. 79

296 297

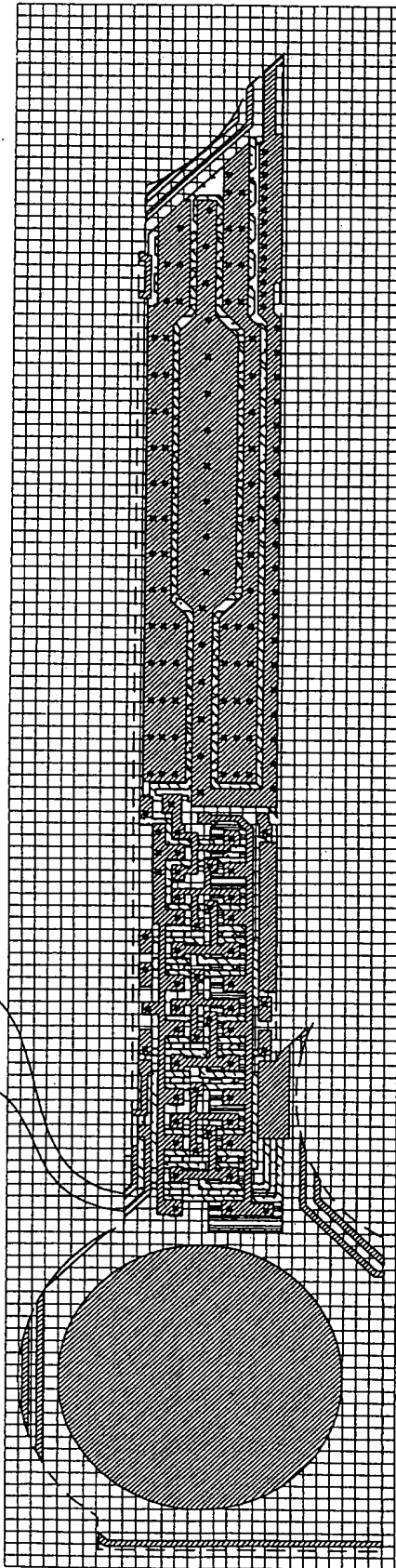


FIG. 80



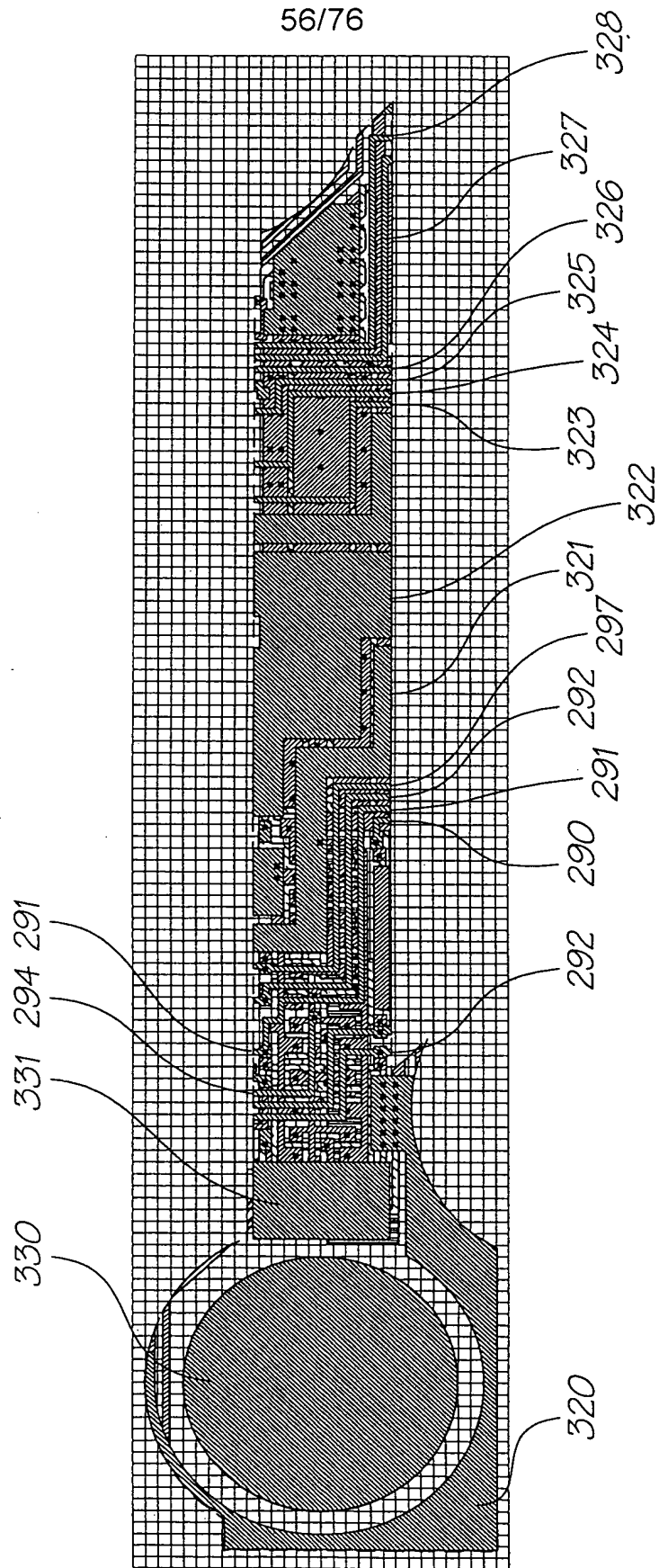


FIG. 81

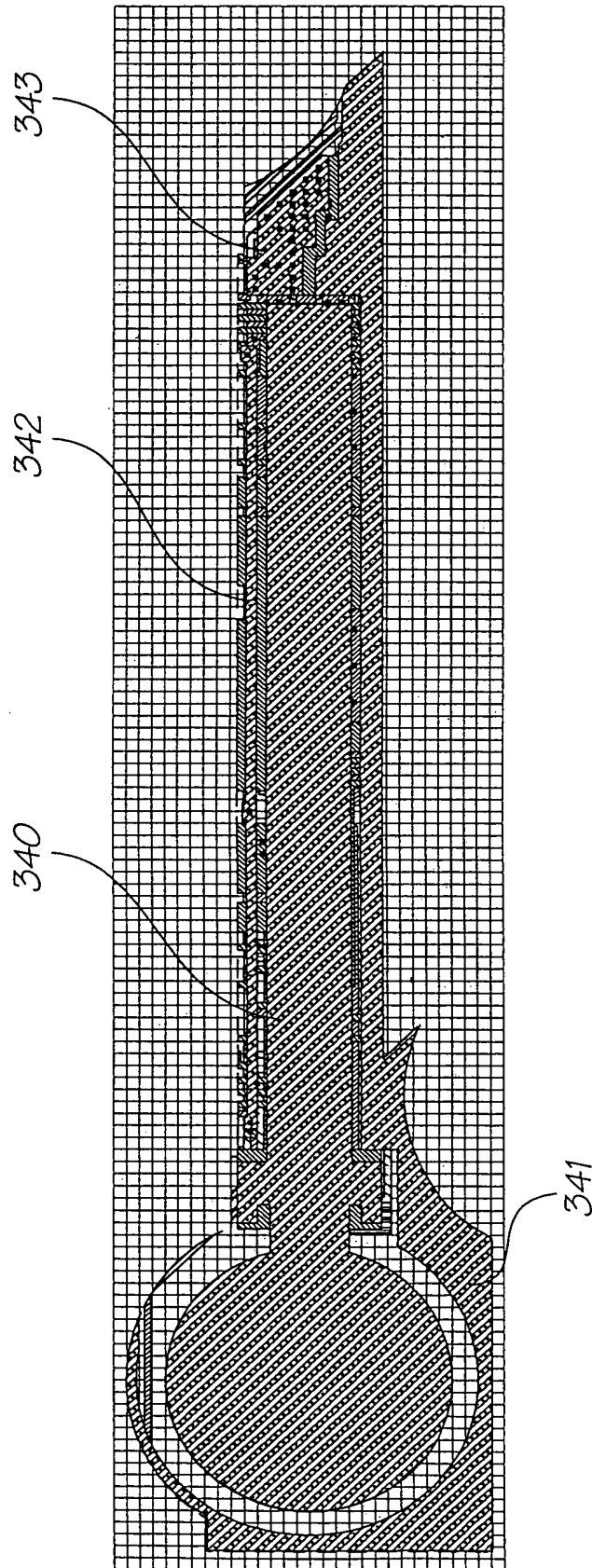


FIG. 82

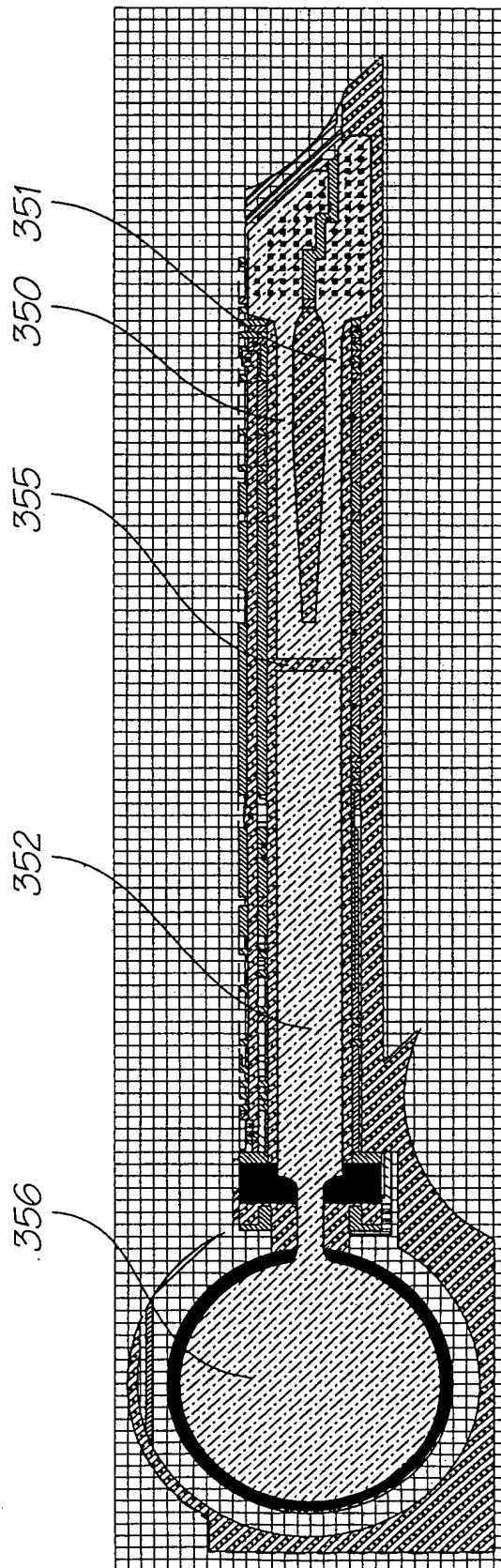


FIG. 83

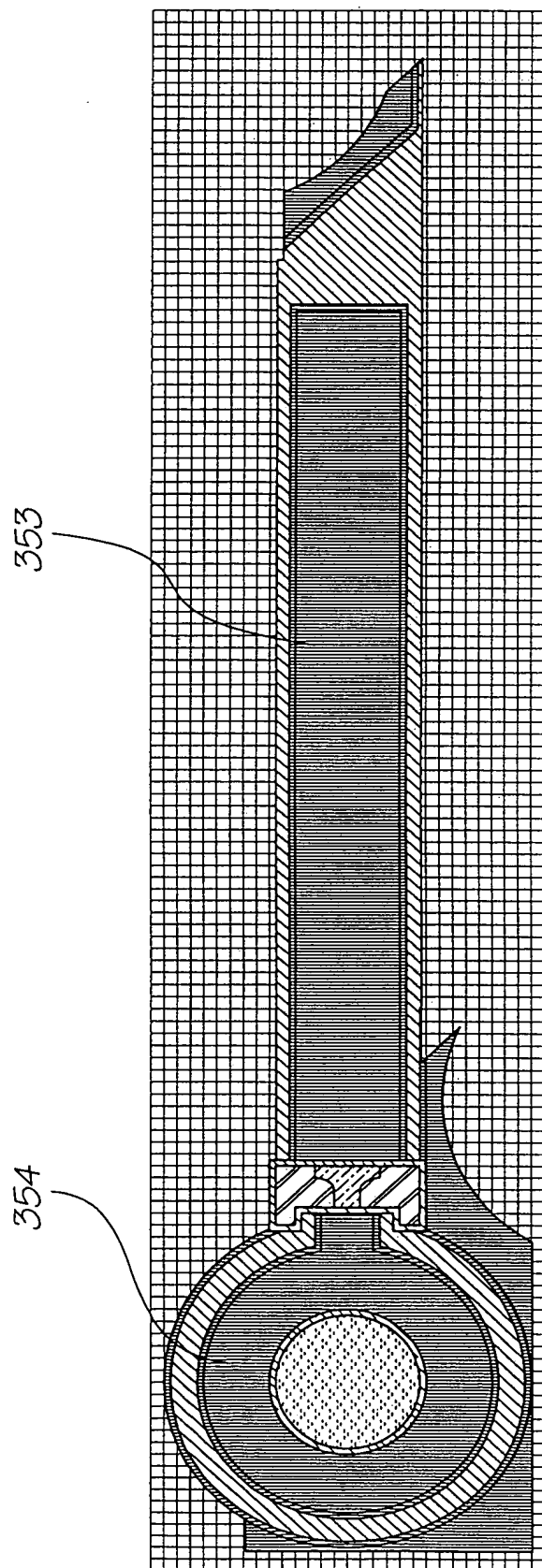


FIG. 84

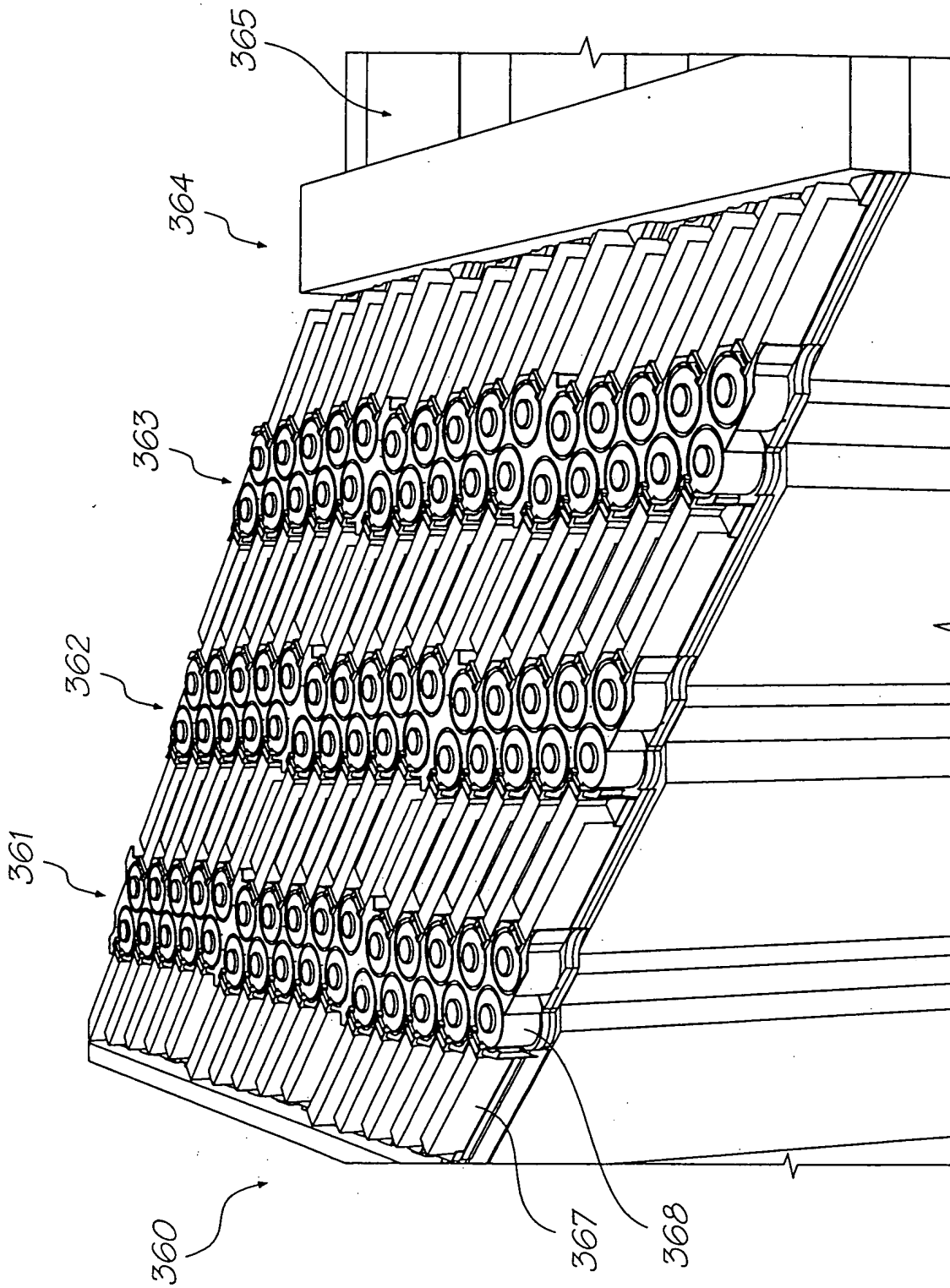


FIG. 85

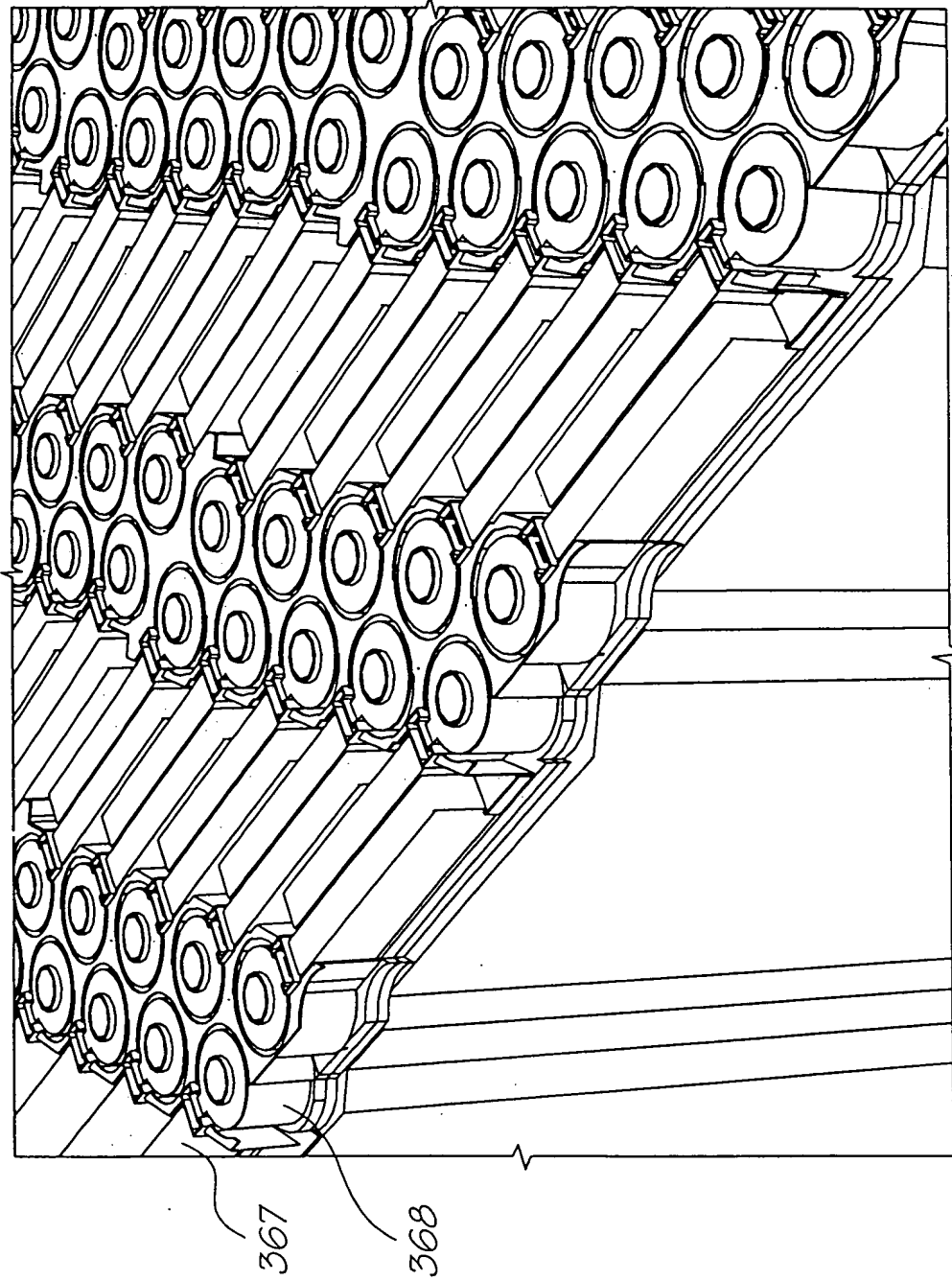


FIG. 86

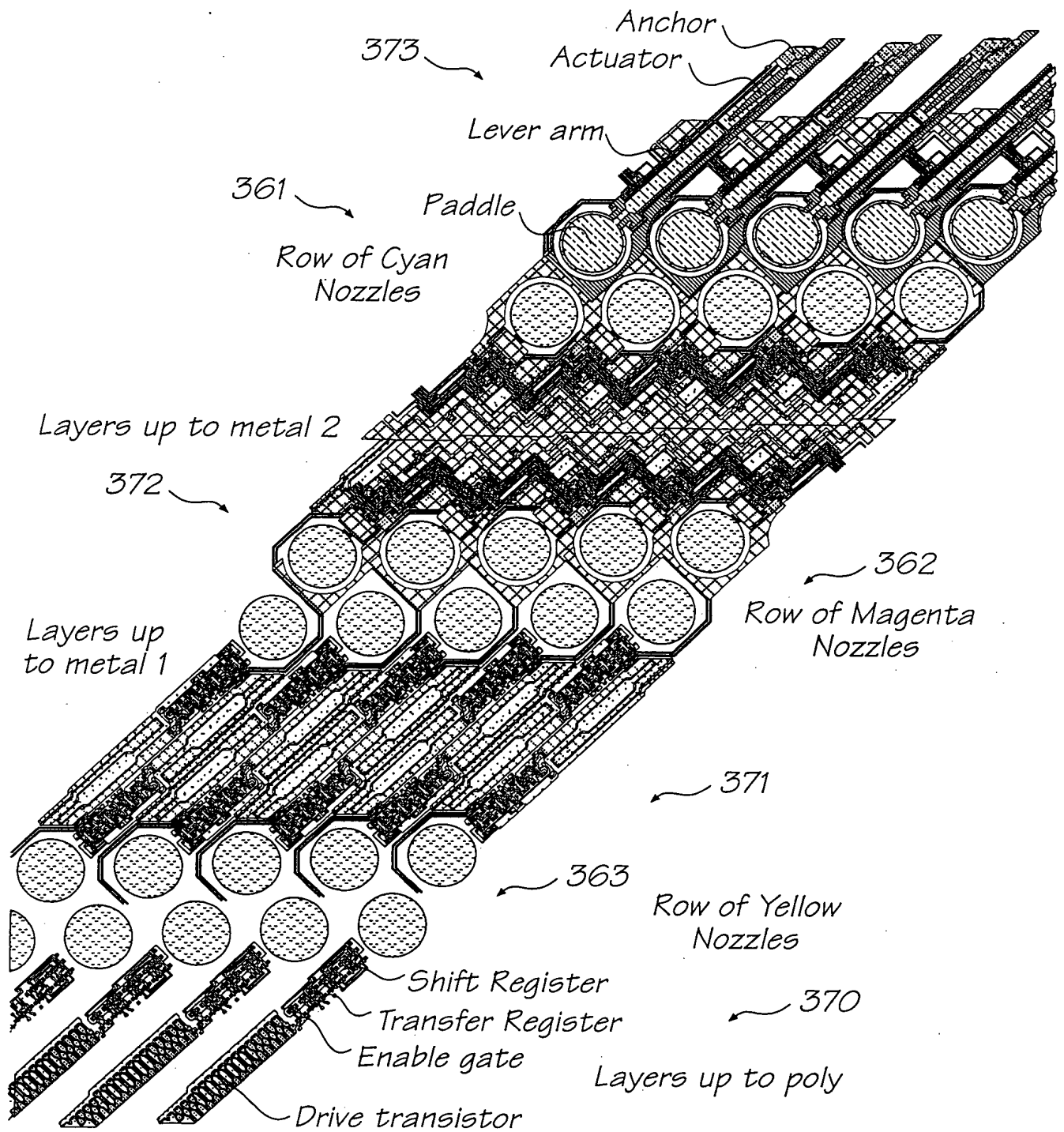


FIG. 87

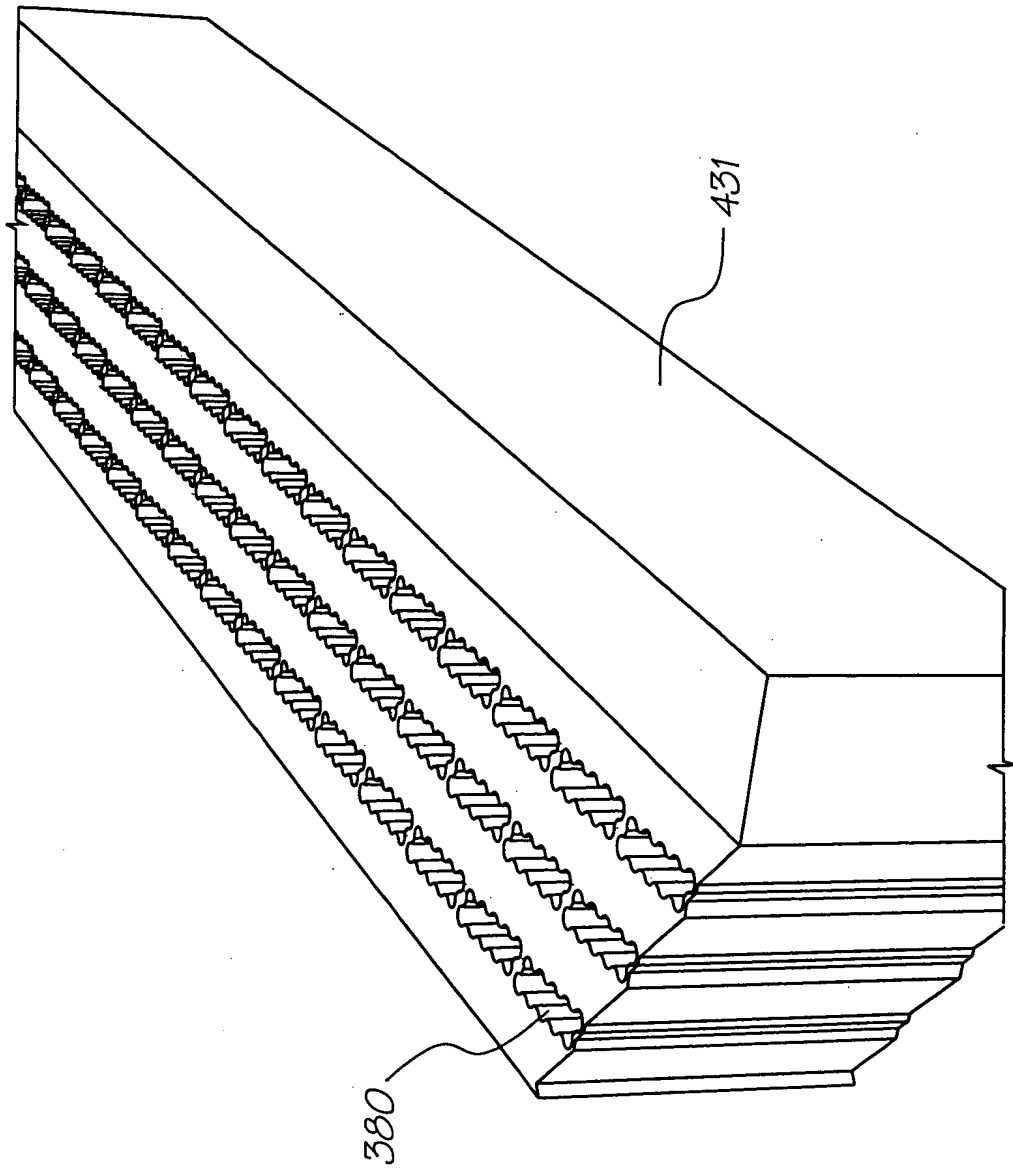


FIG. 88



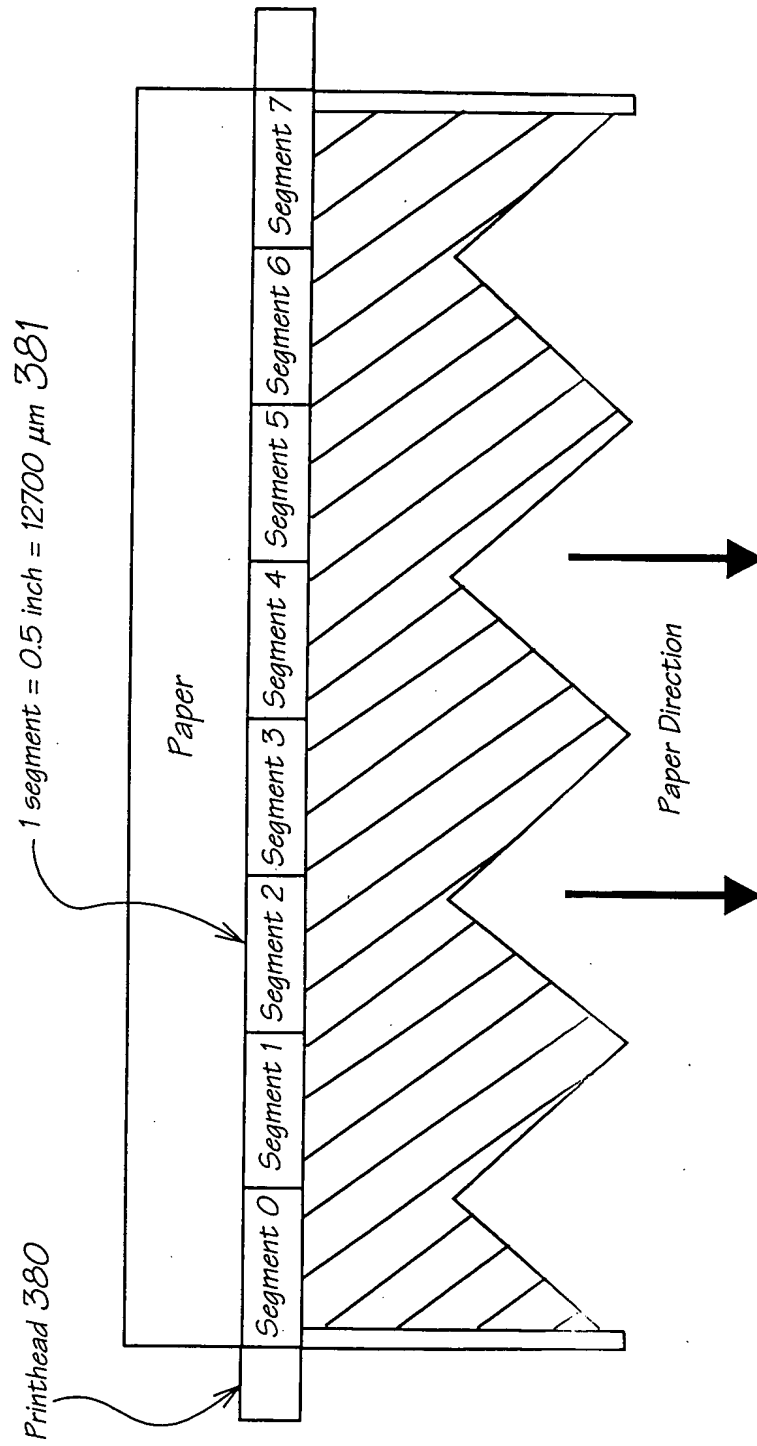
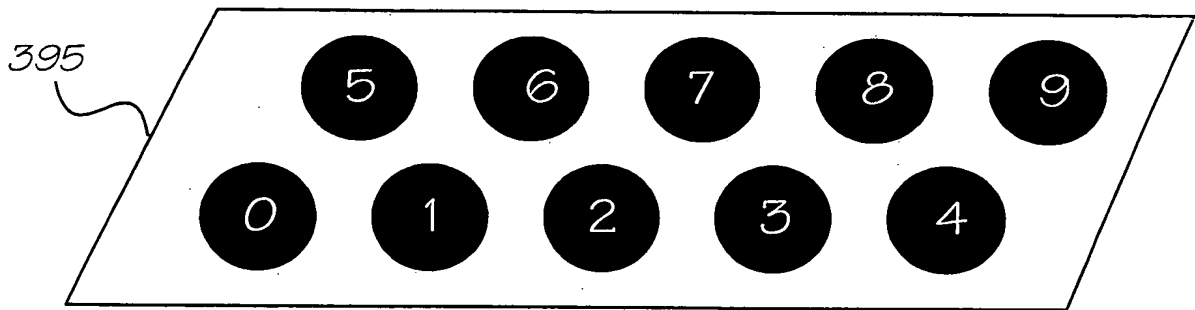


FIG. 89



A single pod, numbered by firing order

Fig. 90

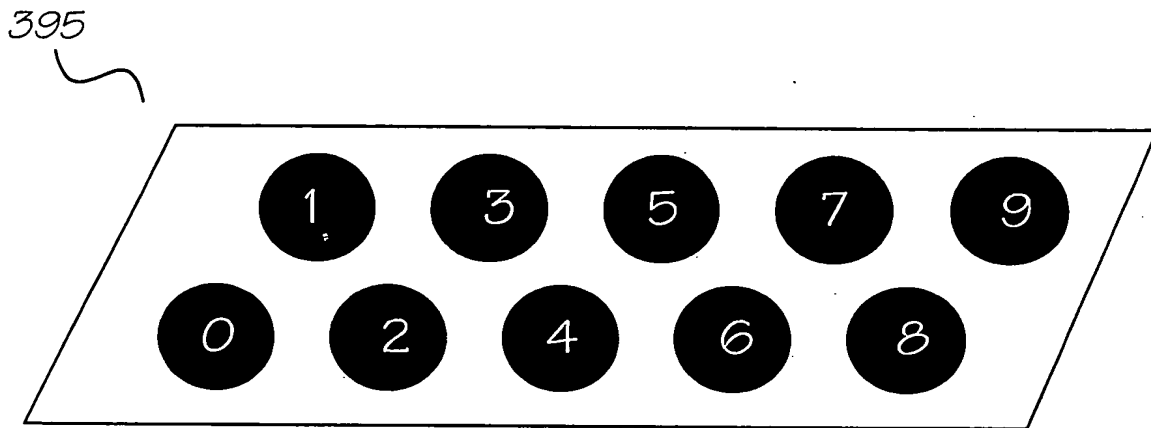


Fig. 91

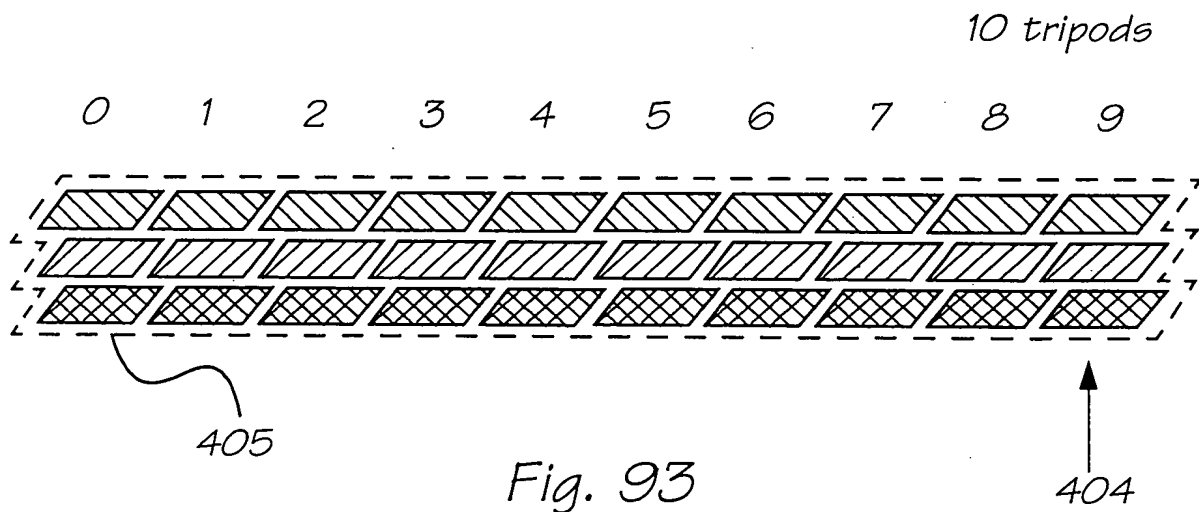


Fig. 93

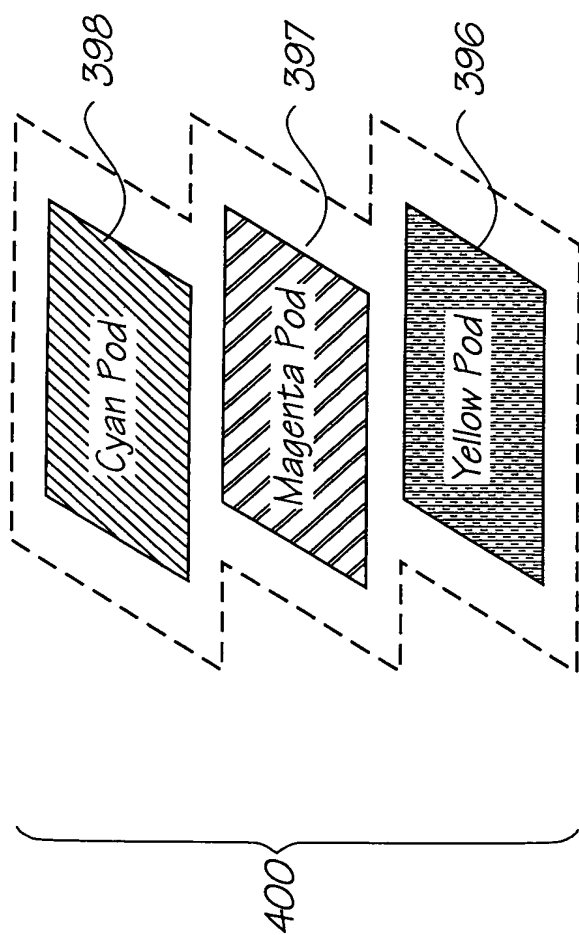


FIG. 92

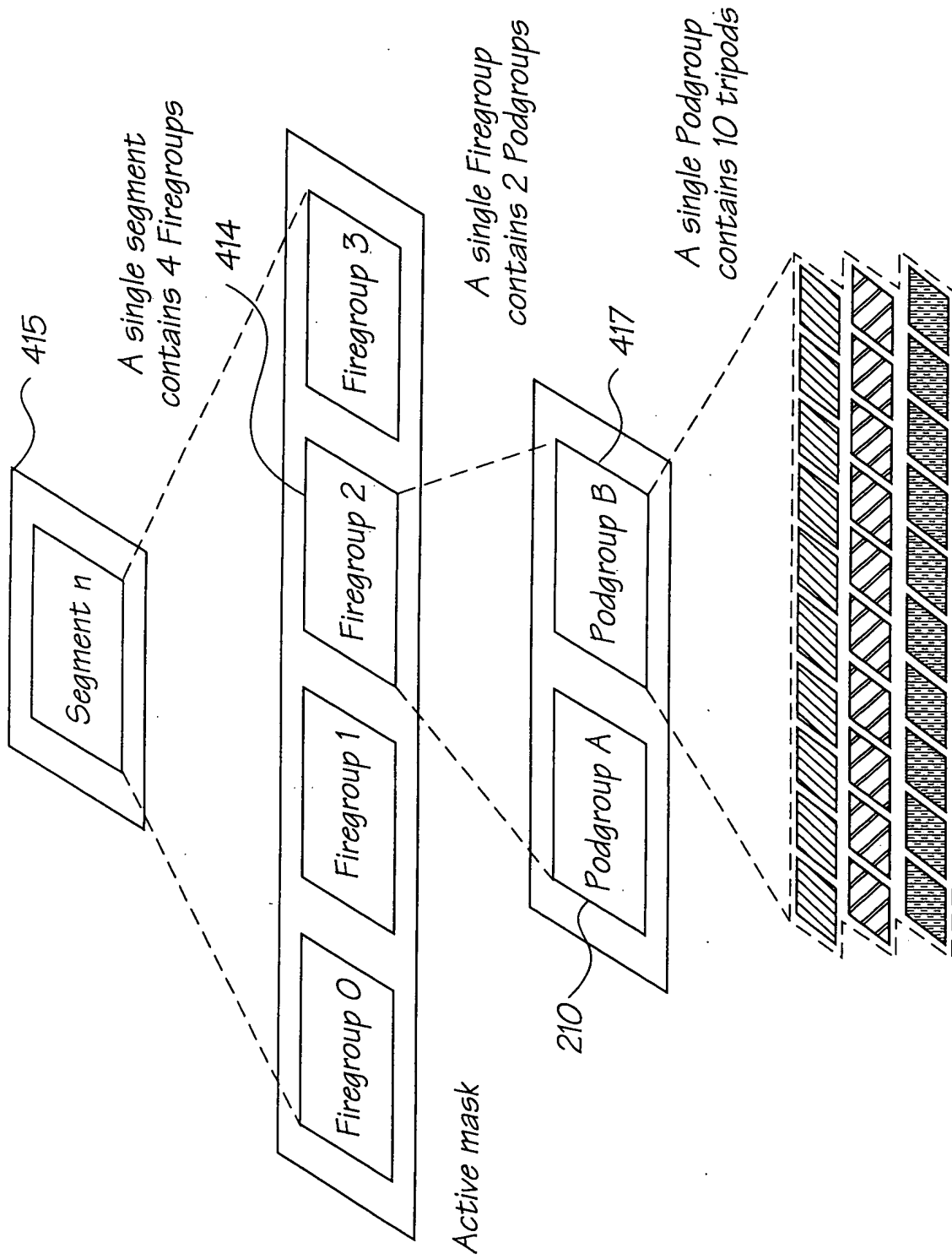


FIG. 94

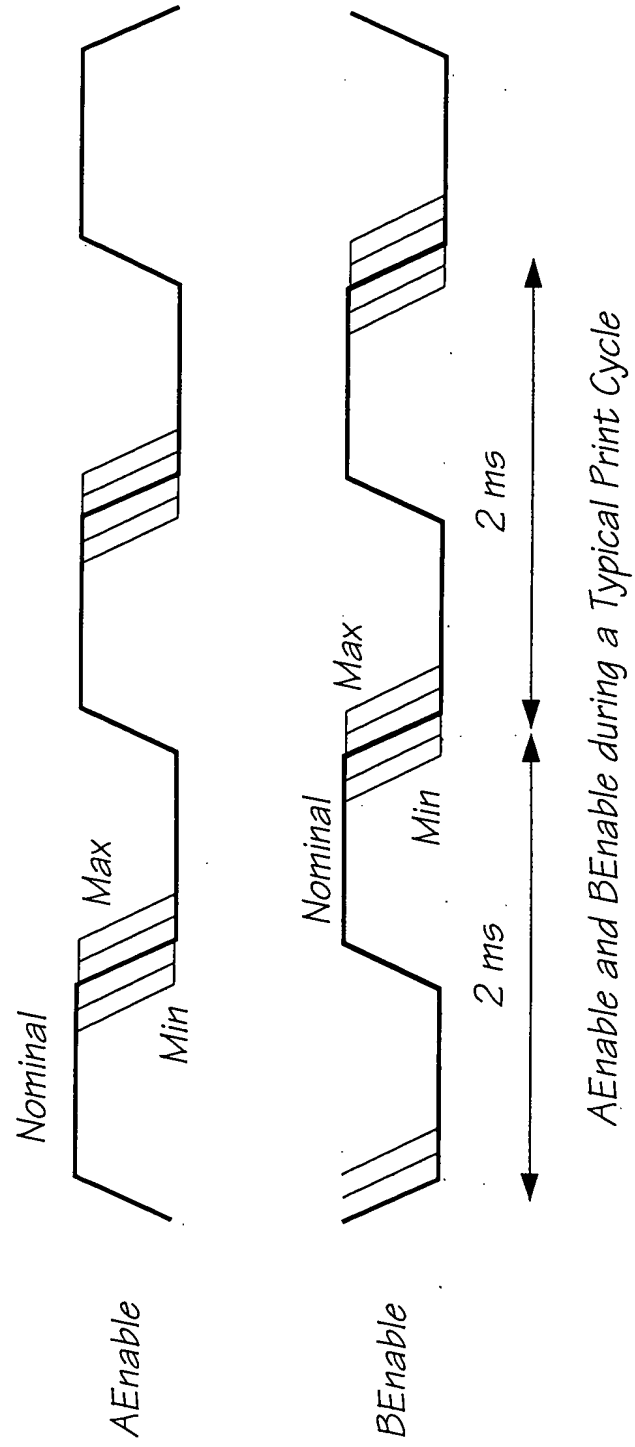


Fig. 95

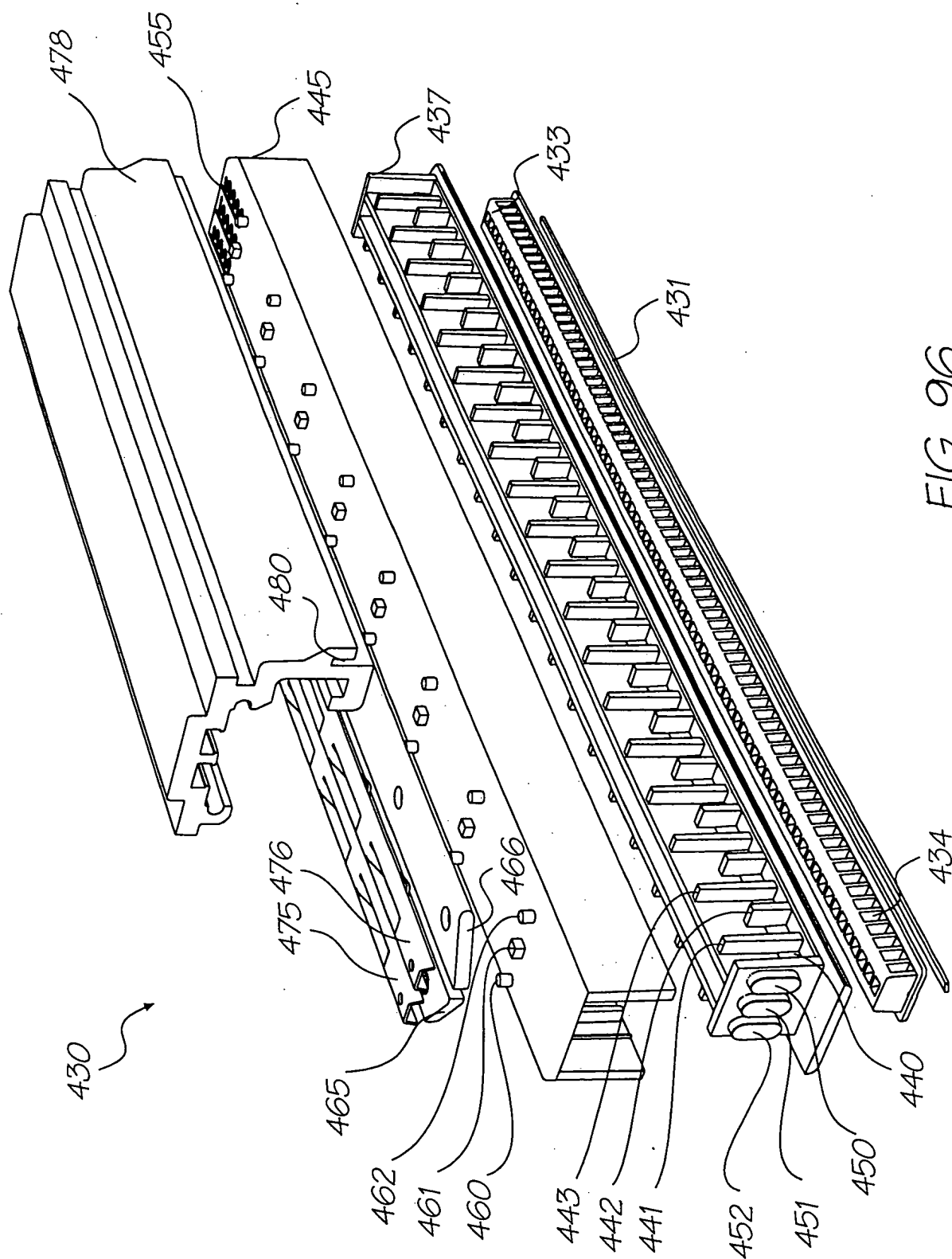


FIG. 96

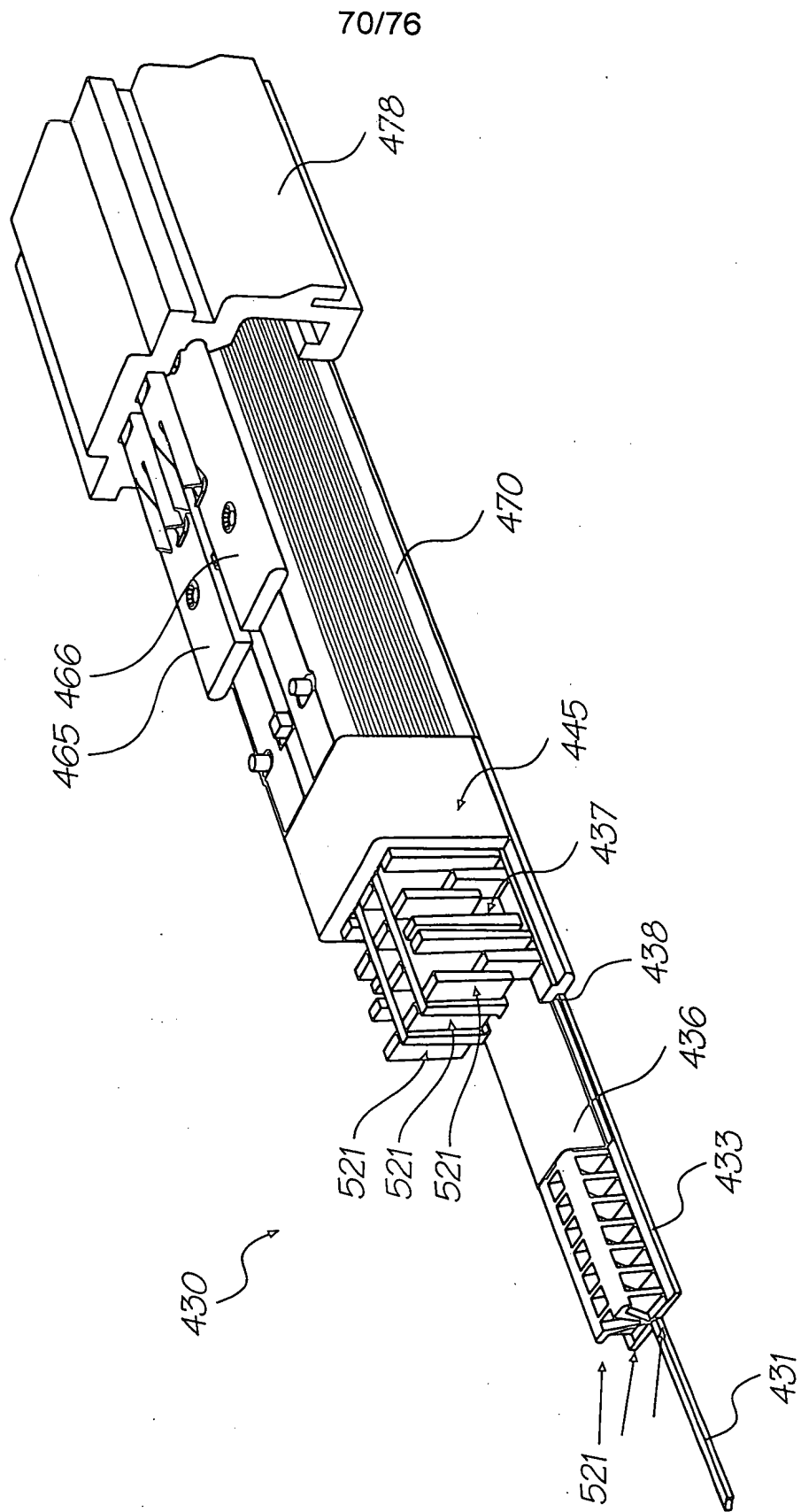


FIG. 97

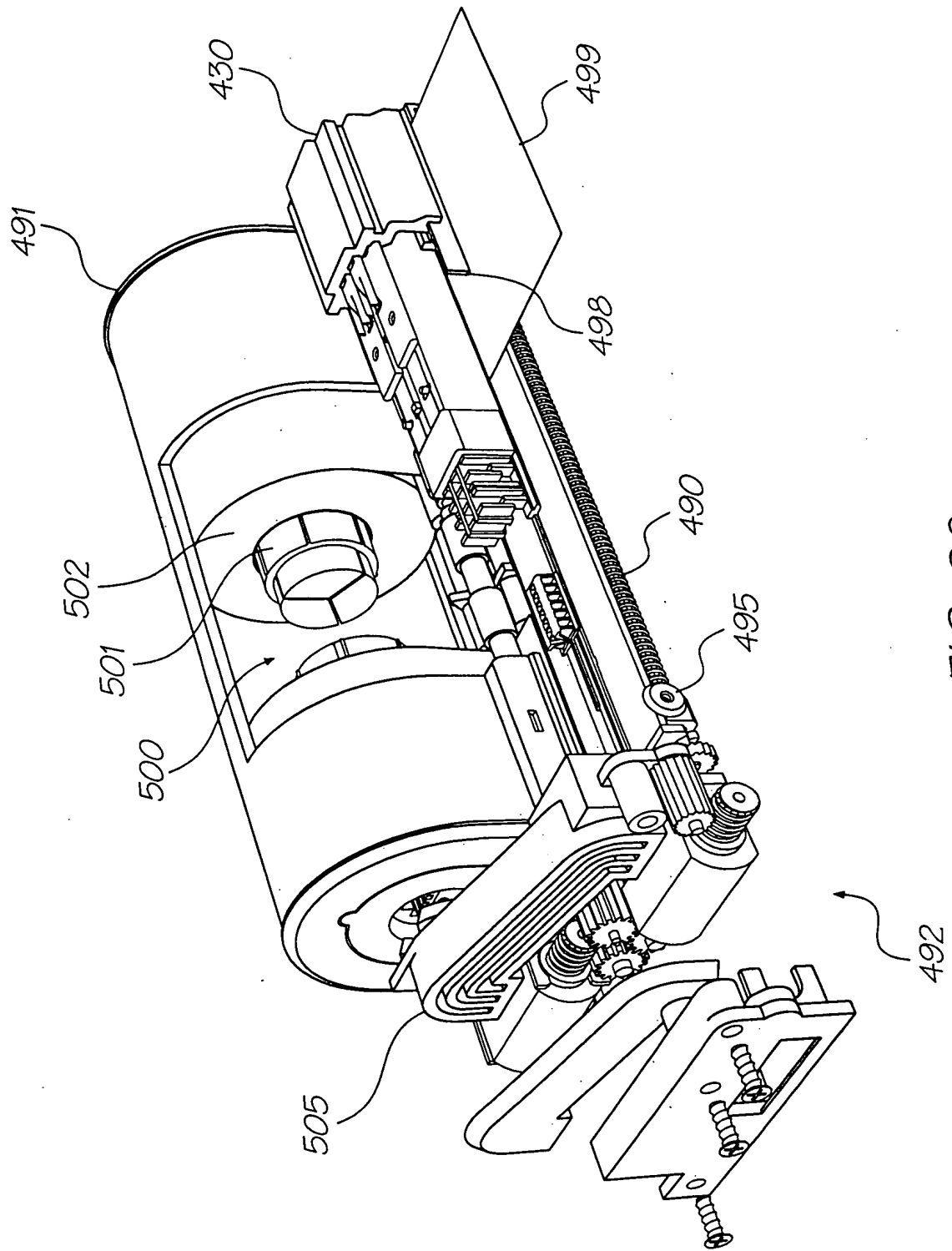


FIG. 98



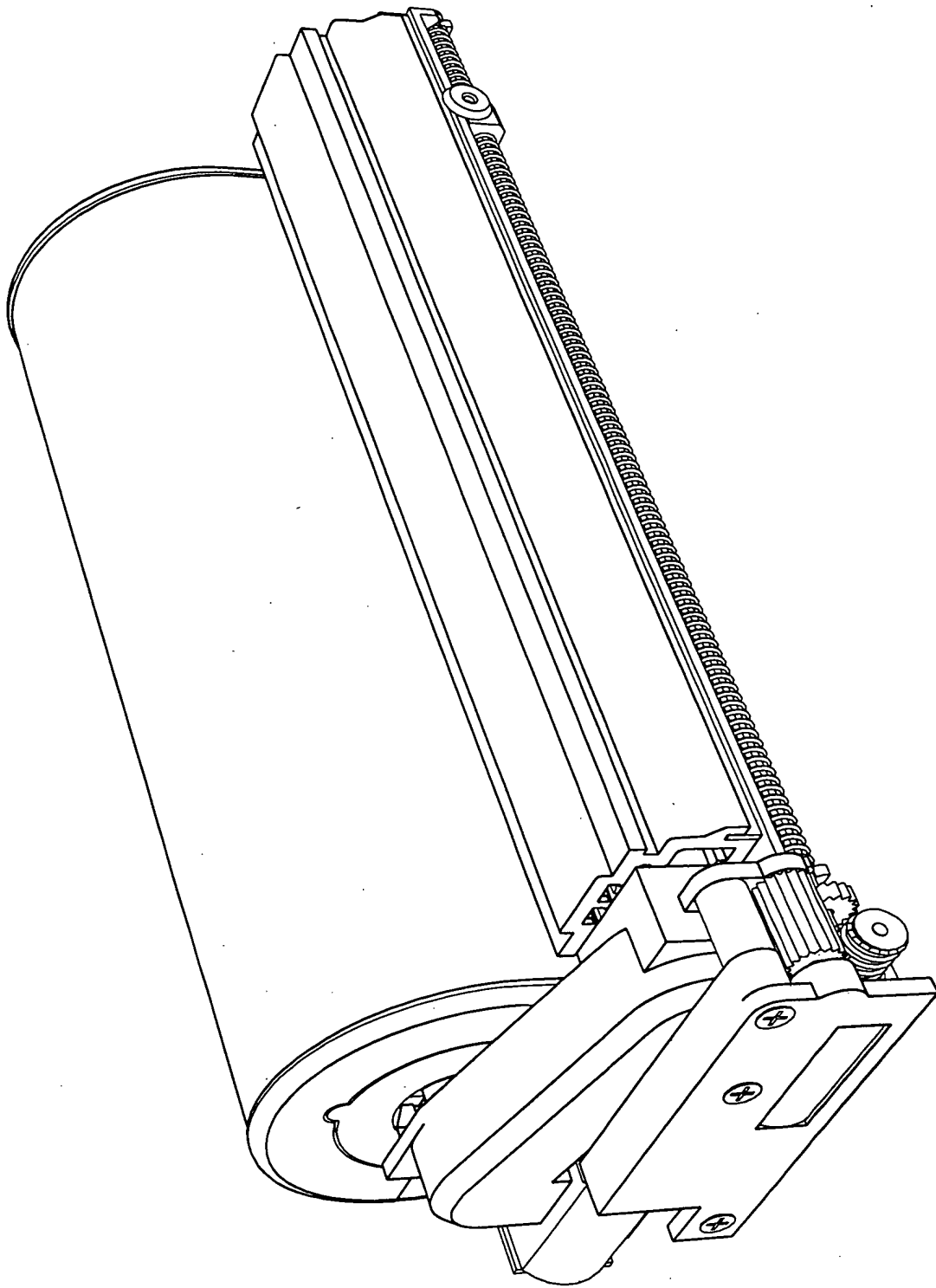


FIG. 99

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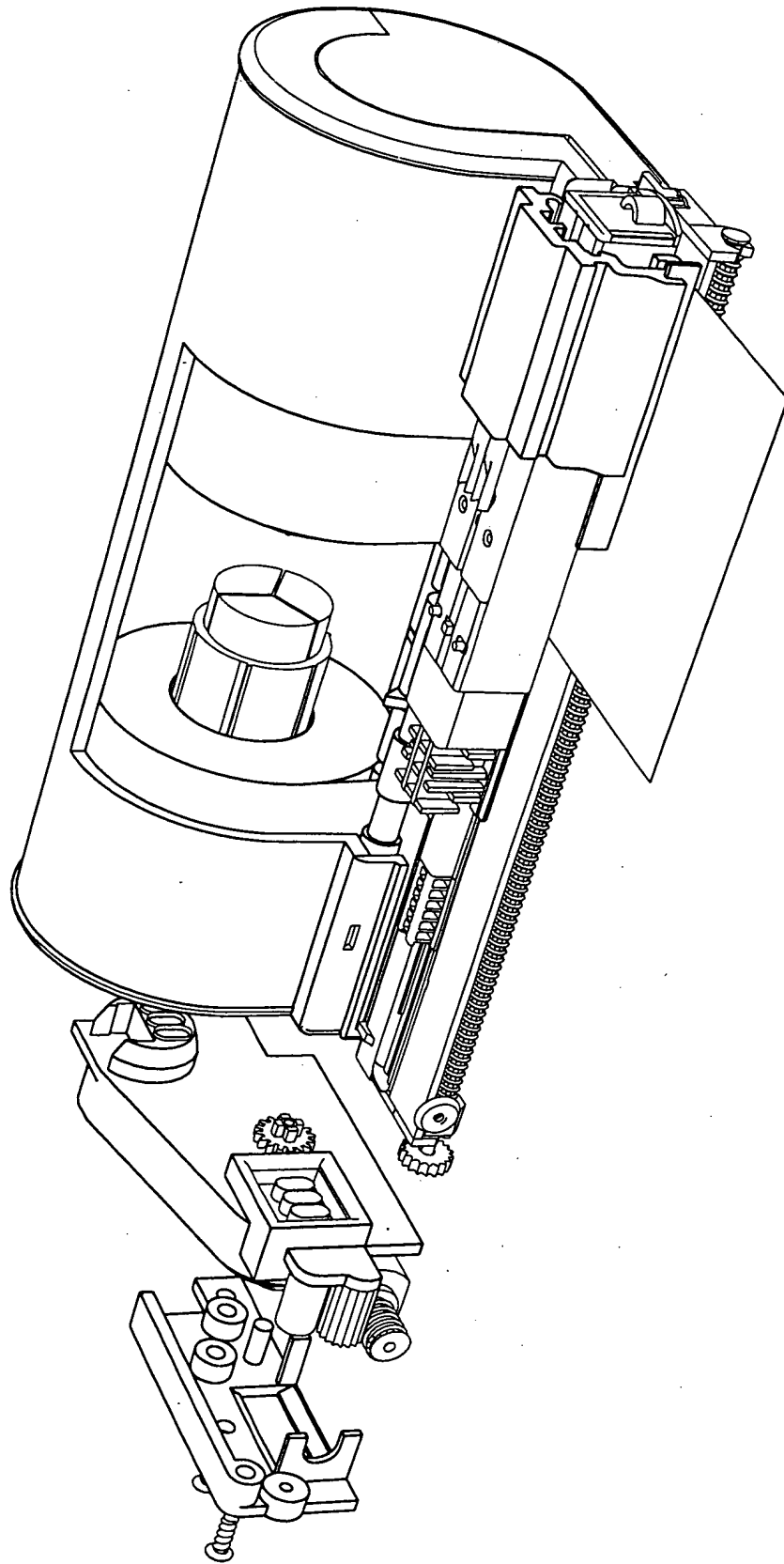


FIG. 100

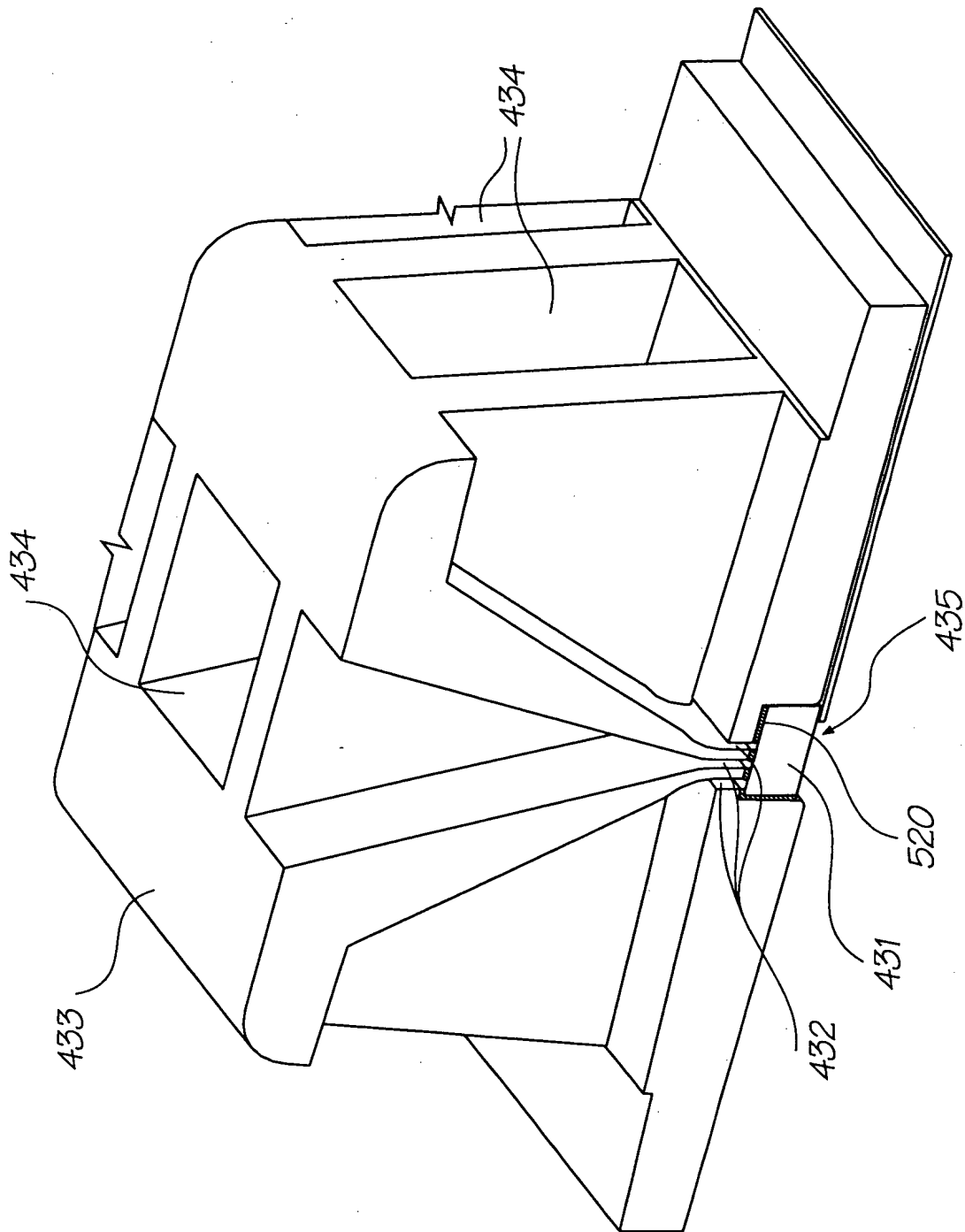


FIG. 101

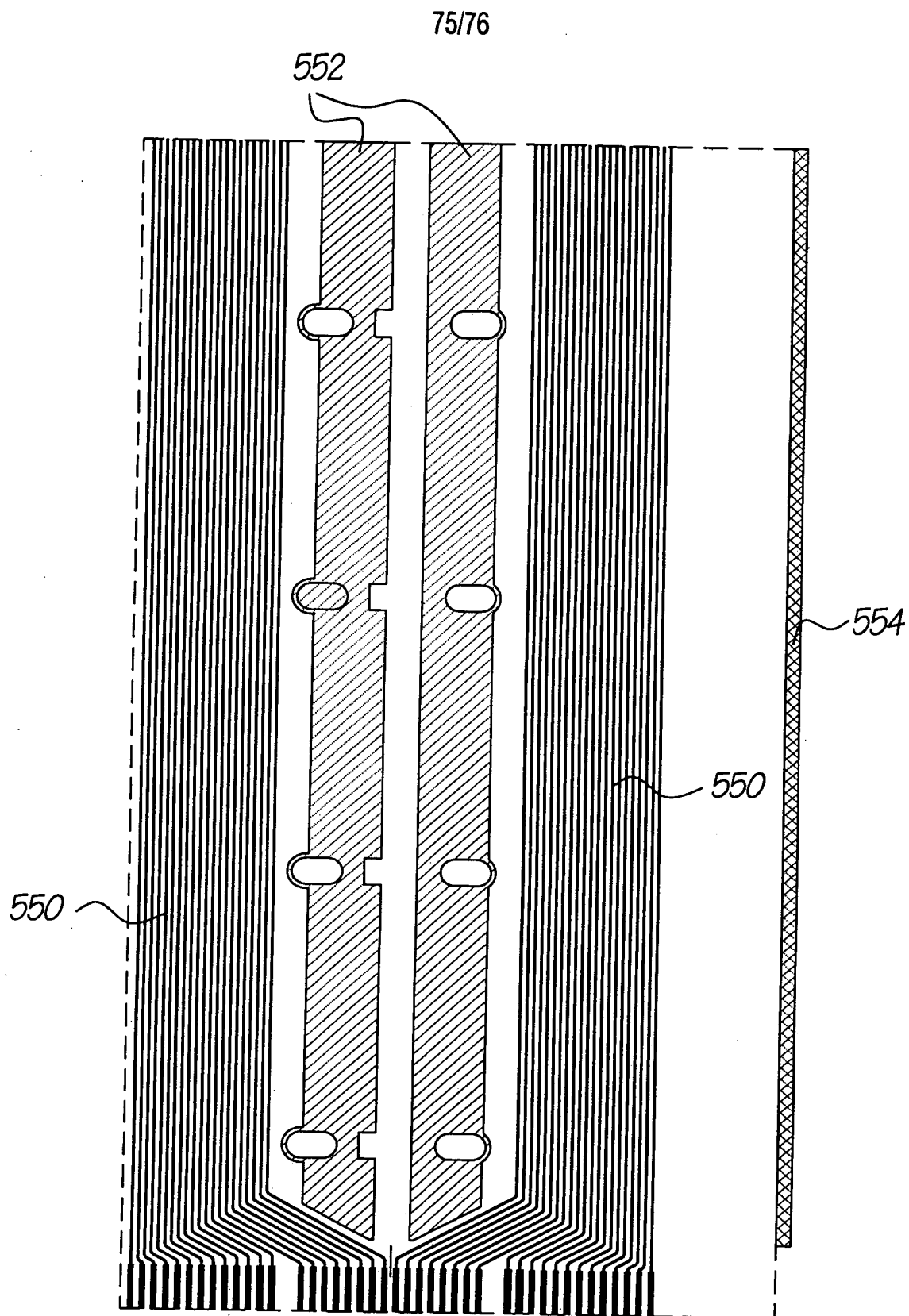


FIG. 102

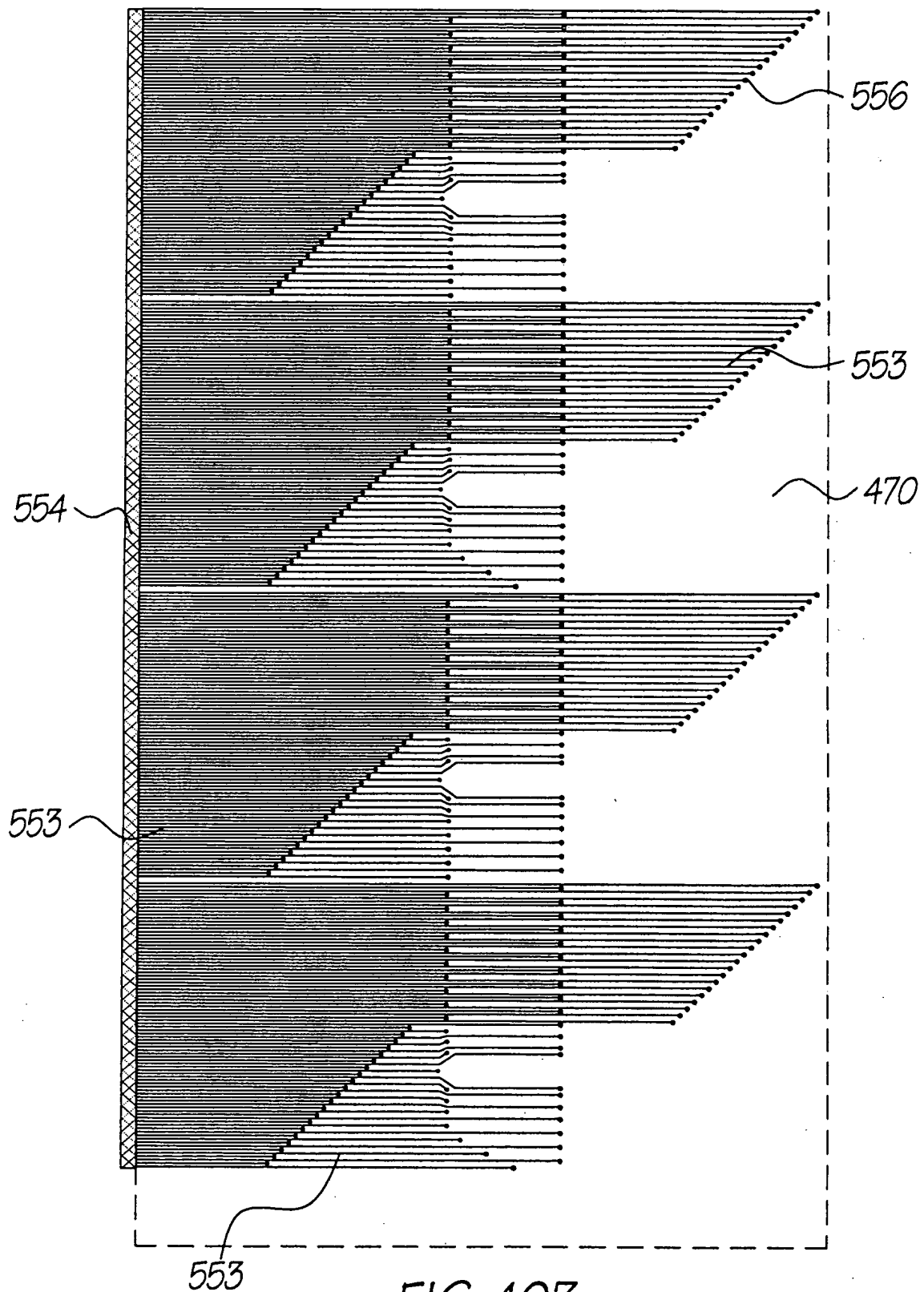


FIG. 103